



HUAWEI MG323 GSM M2M Module

# **AT Command Interface Specification**

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## About This Document

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### History

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# Contents

<b>1 Overall Description .....</b>	<b>1</b>
1.1 Content Description.....	1
1.2 Product Description.....	1
1.3 Instructions for Use .....	2
1.4 Overview of AT Command Interfaces.....	2
1.4.1 Description of AT Commands.....	2
1.4.2 Types of AT Commands.....	3
1.4.3 Abort Attributes of AT Commands.....	6
1.4.4 Rules for Running AT Commands .....	6
1.5 Organization of This Document.....	7
<b>2 Commands for Configuration .....</b>	<b>9</b>
2.1 AT&F - Command for Restoring Factory Settings.....	9
2.2 AT&V - Command for Querying the Current Configuration .....	11
2.3 AT&W - Command for Storing the Current Configuration .....	12
2.4 ATQ - Command for Controlling the Return of Execution Results .....	13
2.5 ATV - Command for Setting the Formats of ME Responses.....	14
2.6 ATZ - Command for Restoring the Settings Saved by the User.....	15
2.7 ATE - Command for Setting Echo .....	15
2.8 AT+CFUN - Command for Setting the Work Mode .....	16
2.8.1 Querying the Supported Work Modes .....	16
2.8.2 Reading the Current Work Mode.....	18
2.8.3 Setting the Work Mode .....	18
2.9 AT+SMO - Command for System Shutdown.....	19
2.9.1 Checking Whether the Command for System Shutdown Exists in the Module .....	19
2.9.2 Setting System Shutdown .....	19
2.9.3 Examples .....	19
2.10 AT+GCAP - Command for Querying the Transmission Capability Domain Supported by the MS .....	20
2.10.1 Checking Whether the Command for Querying the Transmission Capability Domain Exists in the Module .....	20
2.10.2 Listing the Transmission Capability Domain Currently Supported by the MS.....	20
2.10.3 Examples .....	20
2.11 AT+CMEE - Command for Setting Terminal Error Reporting .....	21



2.11.1 Querying the Error Reporting Mode Supported by the Terminal .....	21
2.11.2 Reading the Terminal Error Reporting Mode .....	21
2.11.3 Setting the Terminal Error Reporting Mode .....	22
2.12 AT+CSCS - Command for Setting the TE Character Set.....	22
2.12.1 Querying the Character Set Supported by the TE .....	22
2.12.2 Reading the Character Set of the TE .....	23
2.12.3 Setting the Character Set of the TE .....	23
2.13 AT^SCFG - Extended Command for Setting Configuration Items .....	24
2.13.1 Querying the Configuration Items That Can Be Set by the Module .....	24
2.13.2 Reading the Settings for Configuration Items .....	26
2.13.3 Setting Configuration Items .....	26
2.14 ^SYSSTART – Command for Unsolicitedly Reporting Module Startup.....	26
2.15 ^SHUTDOWN – Command for Unsolicitedly Reporting Module Power-off .....	27
<b>3 Commands for Status Control .....</b>	<b>28</b>
3.1 AT+CMER - Command for Setting Event Reporting .....	28
3.1.1 Querying the Supported Settings for Event Reporting .....	28
3.1.2 Reading the Current Settings for Event Reporting .....	29
3.1.3 Setting the Event Reporting Mode .....	29
3.2 AT+CIND - Command for Controlling Indication Events .....	29
3.2.1 Querying the Supported Indication Events and Indication Status .....	30
3.2.2 Reading the Current Indication Status.....	31
3.2.3 Setting Whether to Report Indication Events .....	31
3.2.4 Examples .....	32
3.3 AT^SIND - Extended Command for Controlling Indication Events.....	32
3.3.1 Querying the Supported Report Events .....	32
3.3.2 Reading the Current Event Reporting Mode .....	34
3.3.3 Setting the Event Reporting Mode .....	35
3.4 AT+WS46 - Command for Selecting a Radio Network.....	35
3.4.1 Querying the Supported Radio Networks.....	35
3.4.2 Reading the Current Radio Network .....	36
3.4.3 Setting the Radio Network to Be Registered.....	36
3.5 +CIEV – Command for Indicating the Status Change.....	36
<b>4 Commands for Serial Port Control .....</b>	<b>37</b>
4.1 AT\Q - Command for Enabling Software or Hardware Flow Control.....	37
4.2 AT&C - Command for Setting the DCD Usage State .....	37
4.3 AT&D - Command for Setting the DTR Usage State.....	38
4.4 AT&S – Command for Setting the DSR Usage State.....	38
4.5 AT+IPR - Command for Setting the Baud Rate of the DTE-DCE .....	39
4.5.1 Querying the Supported Baud Rates of the DTE-DCE .....	39
4.5.2 Reading the Current Baud Rate of the DTE-DCE.....	39
4.5.3 Setting the Baud Rate of the DTE-DCE .....	40



4.6 AT+CMUX - Command for Setting Multiplexing .....	40
4.6.1 Querying the Supported Settings for Multiplexing .....	40
4.6.2 Reading the Current Settings for Multiplexing .....	42
4.6.3 Setting Multiplexing .....	42
<b>5 Commands for Security Control .....</b>	<b>43</b>
5.1 AT+CPIN - Command for PIN Management .....	43
5.1.1 Checking Whether a PIN Management Command Exists .....	43
5.1.2 Reading the Password Entry Request .....	43
5.1.3 Responding to the Password Entry Request .....	44
5.1.4 Examples .....	44
5.2 AT+CLCK - Command for Locking and Unlocking the Device .....	45
5.2.1 Checking the Devices Supported by This Command .....	45
5.2.2 Locking and Unlocking the Device .....	46
5.2.3 Examples .....	47
5.3 AT+CPWD - Command for Modifying the Password .....	47
5.3.1 Checking the Devices Supported by This Command .....	48
5.3.2 Modifying the Password .....	48
5.3.3 Examples .....	49
<b>6 Commands for Identification .....</b>	<b>50</b>
6.1 ATI - Command for Querying the Product Information .....	50
6.1.1 Examples .....	51
6.2 AT+CGMI/GMI - Command for Querying the Vendor Information .....	51
6.2.1 Checking Whether the Command for Querying the Vendor Information Exists .....	52
6.2.2 Querying the Vendor Information Request .....	52
6.2.3 Examples .....	52
6.3 AT+CGMM/GMM - Command for Querying the Product Model .....	52
6.3.1 Checking Whether the Command for Querying the Product Model Exists .....	53
6.3.2 Querying the Product Model Number Request .....	53
6.3.3 Examples .....	53
6.4 AT+CGMR/GMR - Command for Querying the Software Version Number .....	54
6.4.1 Checking Whether the Command for Querying the Software Version Number Exists .....	54
6.4.2 Querying the Software Version Number .....	54
6.4.3 Examples .....	54
6.5 AT+CGSN/GSN - Command for Querying the IMEI .....	55
6.5.1 Checking Whether the Command for Querying the IMEI Exists .....	55
6.5.2 Querying the IMEI .....	55
6.5.3 Examples .....	55
6.6 AT+CIMI - Command for Querying the IMSI .....	56
6.6.1 Checking Whether the Command for Querying the IMSI Exists .....	56
6.6.2 Querying the IMSI .....	56
6.6.3 Examples .....	57



<b>7 Commands for Call Control.....</b>	<b>58</b>
7.1 ATD - Command for Originating a Call.....	58
7.2 ATD*99# - Command for Requesting the GPRS Service .....	59
7.3 ATD*98# - Command for Requesting the GPRS IP Service .....	59
7.4 ATH - Command for Hanging Up the Connection .....	60
7.5 ATA - Command for Answering a Call or Data Services.....	61
7.6 ATS0- Commands for Setting the Automatic Answer Data Services .....	61
7.6.1 Reading the Settings of the Automatic Answer Data Services.....	61
7.6.2 Setting Unsolicitedly Answering Data Services .....	62
7.7 ATS7 - Command for Setting the Duration to Be Waited for Completion of Connection Establishment.....	62
7.7.1 Reading the Set Waiting Duration Request.....	62
7.7.2 Setting the Waiting Duration.....	63
7.8 AT+CRLP - Command for Setting Radio Link Protocol Parameters for Non-Transparent Transmission Data Services on the Calling Party Side.....	63
7.8.1 Querying the Supported RLP Parameters.....	63
7.8.2 Reading RLP Parameters for the Current Non-Transparent Transmission Data Services on the Calling Party Side .....	64
7.8.3 Setting RLP Parameters for the Non-Transparent Transmission Data Services on the Calling Party Side .....	64
7.9 AT+CBST - Command for Setting the Bearer Service Type .....	64
7.9.1 Querying the Supported Bearer Service Types.....	65
7.9.2 Querying the Current Bearer Service Type .....	65
7.9.3 Setting the Bearer Service Type.....	65
7.10 +++ - Command for Switching Data Mode to Command Mode .....	66
7.11 ATO - Command for Switching Command Mode to Data Mode.....	66
7.12 AT+CHUP - Command for Hanging Up Data Services .....	67
7.12.1 Checking Whether AT+CHUP Hang-up Is Supported .....	67
7.12.2 AT+CHUP Command for Hanging Up .....	67
7.13 AT+CR - Command for Setting the Service Reporting Mode.....	67
7.13.1 Querying the Supported Settings for Service Reporting .....	68
7.13.2 Reading the Current Settings for Service Reporting .....	68
7.13.3 Setting Service Reporting.....	69
7.14 AT+CRC - Command for Setting the Cell Result Codes .....	69
7.14.1 Querying the Supported Settings for the Cell Result Codes .....	69
7.14.2 Querying the Current Settings for the Cell Result Codes.....	70
7.14.3 Settings the Cell Result Codes.....	70
7.15 AT+VTS - Command for Sending the DTMF Tone.....	70
7.15.1 Sending the DTMF Tone.....	71
7.16 AT+CLIP - Command for Displaying the Calling Line Identification .....	71
7.16.1 Querying the Settings Supported by the AT+CLIP Command .....	71
7.16.2 Reading the Settings of the CLIP Service .....	72
7.16.3 Setting the CLIP .....	72



7.16.4 +CLIP - Command for Unsolicitedly Reporting the CLI.....	72
7.17 RING – Command for Unsolicitedly Reporting Incoming Calls.....	73
7.18 +CRING – Command for Unsolicitedly Reporting Incoming Calls.....	73
<b>8 Commands for Network Services .....</b>	<b>74</b>
8.1 AT+COPN - Command for Querying the Operator Name .....	74
8.1.1 Checking Whether This Command Is Supported .....	74
8.1.2 Reading the List of Operators .....	75
8.1.3 Examples .....	75
8.2 AT+COPS - Command for Selecting Operators.....	75
8.2.1 Checking the Current Available Network and Operator Information .....	76
8.2.2 Reading the Currently Registered Network and Operator Information .....	77
8.2.3 Setting the Current Operator Information .....	77
8.2.4 Examples .....	77
8.3 AT+CREG - Command for Querying Network Registration .....	78
8.3.1 Checking the Parameter Range Supported by This Command .....	78
8.3.2 Querying the Current Status of Network Registration .....	79
8.3.3 Setting the Status of Network Registration.....	79
8.3.4 +CREG – Command for Unsolicitedly Reporting the Network Registration Status .....	80
8.3.5 Examples .....	80
8.4 AT+CSQ - Command for Querying the Signal Quality .....	80
8.4.1 Checking the Parameter Range Supported by This Command .....	81
8.4.2 Querying the Current Signal Quality.....	82
8.4.3 Examples .....	82
8.5 AT^SMONC - Command for Querying the Cell Information.....	82
8.5.1 Checking Whether This Command Is Available .....	83
8.5.2 Querying the Cell Information.....	83
8.5.3 Examples.....	84
8.6 AT^SMOND - Command for Querying the Cell Information (Including Neighbor Cells) .....	84
8.6.1 Checking Whether This Command Is Available .....	84
8.6.2 Querying the Cell Information.....	85
8.6.3 Examples .....	86
8.7 AT^MONI - Command for Querying the Cell Information in Idle and Dedicated Modes .....	86
8.7.1 Checking the Parameter Range Supported by This Command .....	86
8.7.2 Obtaining the Information About the Serving Cell or Dedicated Cells.....	89
8.7.3 Periodically Obtaining the Information About the Serving Cell or Dedicated Cells. ....	89
8.7.4 Examples .....	90
8.8 AT^MONP - Command for Monitoring Idle Neighbor Cells .....	91
8.8.1 Checking the Parameter Range Supported by This Command .....	92
8.8.2 Obtaining the Monitoring Information About Neighbor Cells .....	93
8.8.3 Periodically Obtaining the Monitoring Information About Neighbor Cells.....	94
8.8.4 Examples .....	94





8.9 AT^SMONG - Command for GPRS Monitoring.....	96
8.9.1 Checking the Parameter Range Supported by This Command.....	96
8.9.2 Obtaining the Information About the Cells That Support the GPRS Function.....	98
8.9.3 Obtaining the Information About the Cells That Support the GPRS Function.....	99
8.9.4 Examples.....	99
8.10 AT^SPLM - Command for Reading the PLMN List .....	101
8.10.1 Checking Whether This Command Is Available .....	102
8.10.2 Querying the List of Operator Names Saved on the ME.....	102
8.10.3 Examples.....	102
8.11 AT+CPOL - Command for Setting the List of Preferred Operators .....	103
8.11.1 Checking the Parameter Range Supported by This Command .....	103
8.11.2 Querying the List of Preferred Operators .....	104
8.11.3 Setting the List of Preferred Operators.....	104
8.11.4 Examples .....	104
8.12 AT^SPLR - Command for Querying Preferred Operators .....	105
8.12.1 Checking the Parameter Range Supported by This Command.....	105
8.12.2 Querying the Current Range of Preferred Operators .....	105
8.12.3 Examples.....	106
8.13 AT^SPLW - Command for Writing Preferred Operators .....	106
8.13.1 Checking the Parameter Range Supported by This Command.....	106
8.13.2 Writing the Information About Preferred Operators.....	107
8.13.3 Examples.....	107
8.14 AT+CNUM - Command for Querying Subscriber Numbers .....	107
8.14.1 Checking Whether This Command Is Available .....	108
8.14.2 Querying the MSISDN Related to Subscribers .....	108
8.14.3 Examples.....	109
<b>9 Commands for Data Services.....</b>	<b>110</b>
9.1 AT+CGACT - Command for Activating or Deactivating the PDP Context.....	110
9.1.1 Querying the Supported Status of PDP Context .....	110
9.1.2 Reading the Activation State of the PDP Context.....	111
9.1.3 Setting the Activation State of the PDP Context.....	111
9.1.4 Examples .....	111
9.2 AT+CGATT - Command for Attaching the MT to or Detaching the MT from the GPRS Service... 112	
9.2.1 Checking the Supported GPRS Service State .....	112
9.2.2 Querying the Current GPRS Service State .....	113
9.2.3 Setting the GPRS Service State.....	113
9.2.4 Examples .....	113
9.3 AT+CGEREP - Command for Reporting GPRS Events.....	114
9.3.1 Checking the Supported GPRS Event Reporting Mode.....	114
9.3.2 Reading the GPRS Event Reporting Mode .....	115
9.3.3 Setting the GPRS Event Reporting Mode .....	115



9.4 AT+CGDATA - Command for Entering the Data Mode .....	116
9.4.1 Querying the Layer-2 Protocol Supported Between the TE and MT .....	117
9.4.2 Establishing Communication Between the TE and Network .....	117
9.4.3 Examples .....	118
9.5 AT+CGDCONT - Command for Defining the PDP Context.....	118
9.5.1 Querying the Range of PDP Related Parameters.....	119
9.5.2 Reading the Status of the PDP Context .....	120
9.5.3 Setting the Status of the PDP Context .....	120
9.5.4 Examples.....	120
9.6 AT+CGPADDR - Command for Reading the PDP Address .....	121
9.6.1 Querying the Supported PDP Index Value .....	121
9.6.2 Reading the PDP Address List of the Specified PDP Context .....	121
9.6.3 Examples .....	122
9.7 AT+CGQMIN - Command for Setting the Acceptable Minimum Quality of Service Profile.....	122
9.7.1 Querying the Supported QoS Parameter Range .....	123
9.7.2 Querying the Minimum QoS of All PDP Contexts.....	125
9.7.3 Setting the Minimum QoS of a PDP Context.....	126
9.8 AT+CGQREQ - Command for Setting the Requested QoS Profile.....	126
9.8.1 Checking the Parameter Range Supported by the Command.....	126
9.8.2 Querying All QoS Levels Specified by the TE .....	129
9.8.3 Setting the QoS of a PDP Context .....	129
9.9 AT+CGREG - Command for Setting Whether to Report the GPRS Network Registration Status	129
9.9.1 Checking the Parameter Range Supported by this Command .....	130
9.9.2 Querying the Parameters Unsolicitedly Reported When the Current GPRS Registration Status Changes .....	130
9.9.3 Setting the Parameters Unsolicitedly Reported When the GPRS Registration Status Changes .....	131
9.9.4 +CGREG – Command for Reporting Unsolicitedly .....	131
9.10 AT+CGSMS - Command for Selecting the MO SMS Bearer Domain.....	132
9.10.1 Querying the Supported SMS Bearer Domains .....	132
9.10.2 Reading the Current SMS Bearer Domain.....	132
9.10.3 Setting the SMS Bearer Domain .....	133
9.11 +CGEV – Command for Unsolicitedly Reporting GPRS MT or Network Events .....	133
<b>10 Commands for Internet Services.....</b>	<b>135</b>
10.1 AT^SICS - Command for Creating a Connection Profile.....	135
10.1.1 Checking Whether the SICS Command Is Available .....	135
10.1.2 Reading the Information About Connection Profiles .....	136
10.1.3 Setting the Internet Connection Profile.....	137
10.1.4 Examples.....	137
10.2 AT^SICI - Command for Querying the Connection Profile .....	138
10.2.1 Querying the ID of the Defined Connection Profile .....	139
10.2.2 Querying the Status of the Connection Profile .....	139



10.2.3 Displaying the Status of the Specified Connection Profile.....	140
10.2.4 Examples.....	140
10.3 AT^SISS - Command for Creating the Service Profile .....	141
10.3.1 Checking Whether This Command Is Available .....	141
10.3.2 Reading the Status of the Service Profile.....	141
10.3.3 Setting the Internet Service Profile.....	143
10.3.4 Examples.....	143
10.4 AT^SISI - Command for Querying the Service Profile.....	144
10.4.1 Querying the ID of the Defined Service Profile .....	144
10.4.2 Querying the Status of the Service Profile.....	145
10.4.3 Displaying the Status of the Specified Service Profile.....	146
10.4.4 Examples.....	146
10.5 AT^SISO - Command for Starting Internet Services .....	147
10.5.1 Checking Whether This Command Is Available .....	147
10.5.2 Querying the Open Status of All Services .....	147
10.5.3 Starting a Specified Internet Service .....	148
10.5.4 Examples.....	148
10.6 AT^SISC - Command for Stopping Internet Services.....	149
10.6.1 Checking Whether This Command Is Available .....	149
10.6.2 Stopping a Specified Internet Service .....	149
10.6.3 Examples.....	149
10.7 AT^SISW - Command for Writing Data for Internet Services .....	150
10.7.1 Checking Whether This Command Is Available .....	150
10.7.2 Writing Data to the Buffer of a Service .....	150
10.7.3 ^SISW - Command for Reporting Unsolicitedly.....	151
10.7.4 Examples.....	151
10.8 AT^SISR - Command for Internet Services to Read Data.....	152
10.8.1 Checking Whether the AT^SISR Command Is Available.....	152
10.8.2 Reading Data Out From the Buffer of an Internet Service .....	153
10.8.3 ^SISR - Command for Reporting Unsolicitedly .....	154
10.8.4 Exmaples.....	154
10.9 ^SIS - Command for Unsolicitedly Reporting the Information About Internet Services .....	155
<b>11 Commands for Short Messages.....</b>	<b>156</b>
11.1 AT+CMGD - Command for Deleting Short Messages.....	156
11.1.1 Checking the Parameter Range Supported by the Command.....	156
11.1.2 Deleting Short Messages.....	157
11.1.3 Examples .....	157
11.2 AT+CMGF - Command for Setting the Format of Short Messages.....	158
11.2.1 Checking the Supported Format of Short Messages .....	158
11.2.2 Reading the Format of Short Messages.....	159
11.2.3 Setting the Format of Short Messages .....	159



11.2.4 Examples .....	159
11.3 AT+CMGL - Command for Querying the List of Short Messages .....	160
11.3.1 Checking the Supported Status of Short Messages .....	160
11.3.2 Reading the List of Short Messages .....	161
11.3.3 Examples .....	162
11.4 AT+CMGR - Command for Reading Short Messages .....	162
11.4.1 Testing Whether the Command for Reading Short Messages Is Supported .....	162
11.4.2 Reading Short Messages .....	163
11.5 AT+CMGS - Command for Sending Short Messages .....	164
11.5.1 Testing Whether the Command for Sending Short Messages Exists .....	164
11.5.2 Sending Short Messages .....	164
11.5.3 Examples .....	165
11.6 AT+CMGW - Command for Storing Short Messages .....	165
11.6.1 Checking Whether the Command for Storing Short Messages Is Supported .....	165
11.6.2 Storing Short Messages .....	166
11.6.3 Examples .....	166
11.7 AT+CMSS - Command for Selecting a Short Message from the Memory and Sending It .....	166
11.7.1 Checking Whether the Command for Sending Short Messages Is Available .....	167
11.7.2 Sending a Short Message at the Specified Location .....	167
11.7.3 Examples .....	168
11.8 AT+CNMI - Command for Setting the Notification for a New Short Message .....	168
11.8.1 Checking the Parameter Range Supported by the AT+CNMI Command .....	168
11.8.2 Reading the Status of Short Message Notification .....	170
11.8.3 Setting the Status of Short Message Notification .....	170
11.8.4 Examples .....	170
11.9 AT+CPMS - Command for Setting the Storage Location of Short Messages .....	171
11.9.1 Checking the Storage Location of Short Messages .....	171
11.9.2 Reading the Status of Storage Location .....	172
11.9.3 Setting the Storage Location .....	173
11.9.4 Examples .....	173
11.10 AT+CSCA - Command for Setting the Number of the SMSC .....	173
11.10.1 Checking Whether the Command Is Available .....	174
11.10.2 Reading the Currently Registered Number of the SMSC .....	174
11.10.3 Setting the Number of the SMSC .....	175
11.10.4 Examples .....	176
11.11 AT+CSCB - Command for Selecting the Type of Cell Messages .....	176
11.11.1 Checking the Parameter Range Supported by the Command .....	176
11.11.2 Reading the Current CBM Type .....	177
11.11.3 Setting the Current CBM Type .....	177
11.11.4 Examples .....	177
11.12 AT+CSMS - Command for Setting the Message Service Type .....	178
11.12.1 Checking Whether the Command Is Available .....	178



11.12.2 Reading the Current Message Service Type .....	179
11.12.3 Setting the Message Service Type .....	179
11.12.4 Examples .....	179
11.13 +CMTI – Command for Unsolicitedly Reporting SMS Arrival .....	180
11.14 +CMT – Command for Unsolicitedly Reporting a New SM .....	180
11.15 +CBM – Command for Unsolicitedly Reporting a Cell SM .....	181
11.16 +CDS – Command for Unsolicitedly Reporting a New SM Status Report .....	181
<b>12 Commands for the SIM Card.....</b>	<b>182</b>
12.1 AT+CRSM - Command for Accessing a SIM Card Through Restricted SIM Access .....	182
12.1.1 Checking Whether the +CRSM Command Is Available .....	182
12.1.2 Accessing the SIM Database .....	183
<b>13 Commands for the Phone Book.....</b>	<b>184</b>
13.1 AT+CPBR - Command for Reading the Phone Book.....	184
13.1.1 Checking the Parameter Range Supported by the +CPBR Command .....	184
13.1.2 +CPBR - Command for Reading the Phone Book .....	185
13.1.3 Examples .....	185
13.2 AT+CPBW - Command for Writing the Phone Book .....	186
13.2.1 Checking the Parameter Range Supported by This Command .....	186
13.2.2 Writing a Record into the Phone Book .....	187
13.2.3 Examples .....	187
13.3 AT+CPBS - Command for Selecting the Phone Book Memory .....	188
13.3.1 Checking the Value Range Supported by the +CPBS Command.....	188
13.3.2 Reading the Current Memory of the Phone Book .....	189
13.3.3 Setting the Memory Type of the Phone Book.....	189
13.3.4 Examples .....	189
<b>14 Commands for Hardware Control .....</b>	<b>191</b>
14.1 AT+CALA.....	191
14.1.1 Checking the Parameter Range Supported by This Command .....	191
14.1.2 Querying the Set Alarm Clock .....	192
14.1.3 Setting an Alarm Clock .....	192
14.1.4 +CALA – Command for Reporting Unsolicitedly .....	193
14.1.5 Examples .....	193
14.2 AT+CCLK – Command for Setting the System Time .....	193
14.2.1 Checking Whether the Command for Setting the System Time Exists .....	194
14.2.2 Querying the Current System Time .....	194
14.2.3 Setting the System Time .....	194
14.2.4 Examples .....	195
<b>15 Commands for Audio Control.....</b>	<b>196</b>
15.1 AT^SWSPATH - Command for Switching Between Audio Channels .....	196
15.1.1 Querying the Supported Audio Channel.....	196



15.1.2 Reading the Current Audio Channel.....	197
15.1.3 Switching the Audio Channel.....	197
15.2 AT+CMIC - Command for Adjusting the Microphone Gain Level.....	197
15.2.1 Querying the Supported Microphone Gain Levels .....	197
15.2.2 Querying the Current Microphone Gain Level.....	198
15.2.3 Setting the Microphone Gain Level .....	198
15.3 AT+ECHO - Command for Suppressing the Echo.....	198
15.3.1 Querying the Supported Echo Suppressing Functions .....	199
15.3.2 Reading the Current Settings of the Echo Suppressing Function.....	199
15.3.3 Setting the Echo Suppressing Function .....	200
15.4 AT+CLVL - Command for Adjusting the Speaker Volume .....	200
15.4.1 Querying the Supported Speaker Volume Level .....	200
15.4.2 Reading the Current Speaker Volume.....	201
15.4.3 Setting the Speaker Volume .....	201
15.5 AT+CMUT - Command for Muting and Unmuting the Microphone .....	201
15.5.1 Querying the Supported Muting Settings for the Microphone .....	202
15.5.2 Reading the Current Muting Settings of the Microphone .....	202
15.5.3 Setting the Muting Function of the Microphone.....	203
<b>16 Other Commands .....</b>	<b>204</b>
16.1 A/ - Command for Executing the Previous Command Again .....	204
16.1.1 Execution Command .....	204
16.1.2 Examples.....	204
16.2 ATS3 – Command for Setting the Command Line Ending Character.....	205
16.2.1 Querying the Current Command Line Ending Character .....	205
16.2.2 Setting the Command Line Ending Character.....	205
16.2.3 Examples.....	205
16.3 ATS4 – Command for Setting the Response Format Character .....	206
16.3.1 Querying the Current Format Character.....	206
16.3.2 Setting the Response Format Character.....	207
16.3.3 Examples.....	207
16.4 ATS5 – Command for Setting the Backspace Character .....	207
16.4.1 Querying the Current Backspace Character .....	208
16.4.2 Setting the Current Backspace Character.....	208
16.4.3 Examples.....	208
16.5 ^THERM - Command for Unsolicitedly Reporting Temperature Protection .....	209
<b>17 Appendix .....</b>	<b>210</b>
17.1 List of URC Commands .....	214
17.2 List of CME/CMS ERROR Codes .....	216
17.3 Acronyms and Abbreviations.....	220

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## Figures

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<b>Figure 1-1</b> Interaction between the TE and MT.....	2
<b>Figure 1-2</b> Basic organization format the AT command line.....	3
<b>Figure 1-3</b> An example of returned value of the AT command .....	3



## Tables

<b>Table 1-1</b> Format of a basic command .....	4
<b>Table 1-2</b> Format of an S register command .....	4
<b>Table 1-3</b> Types and formats of extended and vendor-defined commands.....	5
<b>Table 2-1</b> List of factory settings for AT&F .....	9
<b>Table 2-2</b> List of query results for AT&V.....	11
<b>Table 2-3</b> List of commands and parameters that can be stored by AT&W.....	12
<b>Table 2-4</b> Effect of ATV on response formats .....	14
<b>Table 2-5</b> List of execution results .....	14
<b>Table 2-6</b> List of work modes .....	16
<b>Table 2-7</b> Relations between work modes and services .....	17
<b>Table 2-8</b> Character set of the MS .....	23
<b>Table 2-9</b> List of configurable items .....	24
<b>Table 2-10</b> Values of the < tcpWithUrc > parameter .....	25
<b>Table 2-11</b> Values of the <udri> parameter.....	25
<b>Table 2-12</b> Values of the <uri> parameter .....	25
<b>Table 3-1</b> Values of the <indDescr> and <indValue> parameters .....	30
<b>Table 3-2</b> Values of the <indDescr> and <indValue> parameters .....	33
<b>Table 5-1</b> PIN authentication performed by the SIM card.....	44
<b>Table 6-1</b> Composition of the IMEI .....	55
<b>Table 6-2</b> Composition of the IMSI .....	56
<b>Table 7-1</b> Values of <serv> .....	68
<b>Table 7-2</b> Values of <type> .....	69
<b>Table 7-3</b> <type> values.....	73
<b>Table 8-1</b> List of parameters for the serving cell.....	87
<b>Table 8-2</b> List of parameters for dedicated channels.....	87
<b>Table 8-3</b> List of cell information .....	96





<b>Table 10-1</b> Parameter names supported by conType in CSD and GPRS0 .....	136
<b>Table 10-2</b> Values of <srvParmTag> .....	142
<b>Table 10-3</b> Value range of <srvParmValue> and <srvParmTag> .....	142
<b>Table 11-1</b> Structure of <pdu> .....	161
<b>Table 11-2</b> Data structure of TPDU .....	161
<b>Table 13-1</b> Value options of <storage> .....	188
<b>Table 17-1</b> List of effects on AT commands imposed by SIM PIN .....	210
<b>Table 17-2</b> List of URC commands .....	214
<b>Table 17-3</b> Common “CME ERROR” codes .....	216
<b>Table 17-4</b> “CME ERROR” codes related to the GPRS .....	217
<b>Table 17-5</b> “CMS ERROR” codes related to the SMS .....	218
<b>Table 17-6</b> “CME ERROR” codes related to the MG323 only .....	218
<b>Table 17-7</b> Acronyms and abbreviations .....	220



# 1 Overall Description

---

This chapter briefly describes the contents and organization of this document and focuses on the basic knowledge of AT command interfaces.

## 1.1 Content Description

This document describes the AT command interface specification that is supported by Huawei terminal product MG323 module. This document describes certain AT commands (implemented by terminal devices) of international standards such as 3GPP TS 27.007 3d0, 3GPP TS 27.005 320, and ITU-T V.250 [14] according to the requirements of terminal devices. In addition, this document describes the proprietary AT command interfaces that are implemented by terminal devices. These proprietary AT command interfaces help implement a certain function.

This document does not describe the interfaces that have been defined by standards or implemented by the mobile terminal (MT) but are not required by the MG323. The description of AT command interfaces covers only the data packets of interfaces and the methods and processes for the terminal equipment (TE) and the MT to use interfaces, excluding the contents that are not directly related to interfaces. In addition, this document describes only the AT command interfaces falling within the range of Rm interfaces between the TE and MT, excluding the AT command interfaces falling within the range of Um interfaces between the MT and IWF.

## 1.2 Product Description

HUAWEI MG323 (the MG323) is a 2G B2B module product with 50 pins, supporting four GSM frequency bands, that is, GSM850, GSM900, DCS1800, and PCS1900. The MG323 is mainly applicable to industrial modules.

The MG323 provides one external UART interface and supports functions such as SMS, phone book management, data service, and embedded TCP/UDP.

## 1.3 Instructions for Use

You are not advised to use various parameter values that are not described in this document or not supported currently as described in this document.

The AT command parameters described in the following chapters are in two formats: `<>` and `[]`, which are described as follows:

`<...>` The parameter inside these angle brackets is mandatory. The `<>` does not exist in a command.

`[...]` The parameter inside these square brackets is optional. The `[]` does not exist in a command or a response.

`<CR>` Carriage return character. For details, see the description in S3.

`<LF>` Line feed character. For details, see the description in S4.

When an AT command is sent, the characters contained in the name and parameters (excluding SMSs, phone book, and operator name) of the AT command are case insensitive. All the characters contained in the result returned by the AT command must be in upper case (excluding SMSs, phone book, and operator name).

When an AT command is sent, string parameters can be placed inside quotation marks or not. The strings in the result returned by the AT command are placed inside quotation marks.

## 1.4 Overview of AT Command Interfaces

### 1.4.1 Description of AT Commands

An AT command controls the rules for interaction between the TE such as PC and MT such as MS. Figure 1-1 shows the interaction between the TE and MT.

**Figure 1-1** Interaction between the TE and MT

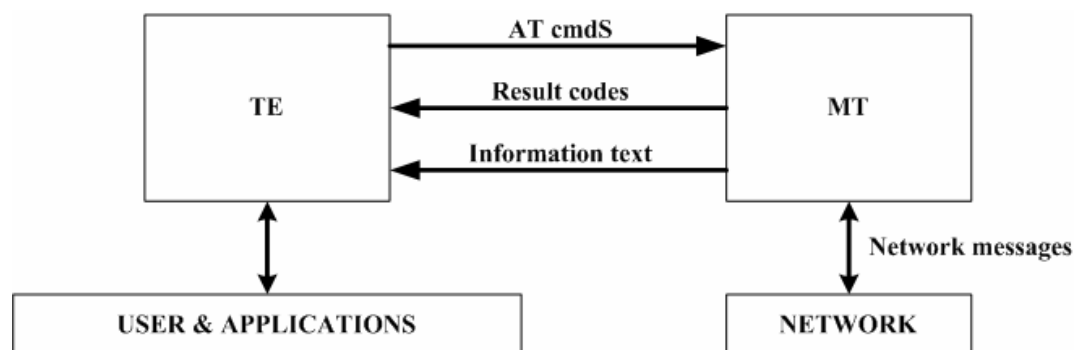
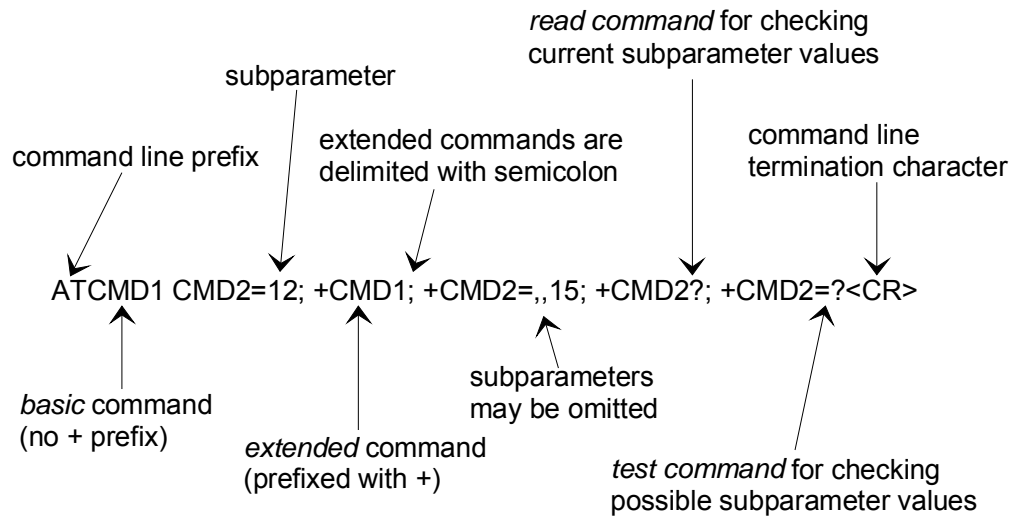


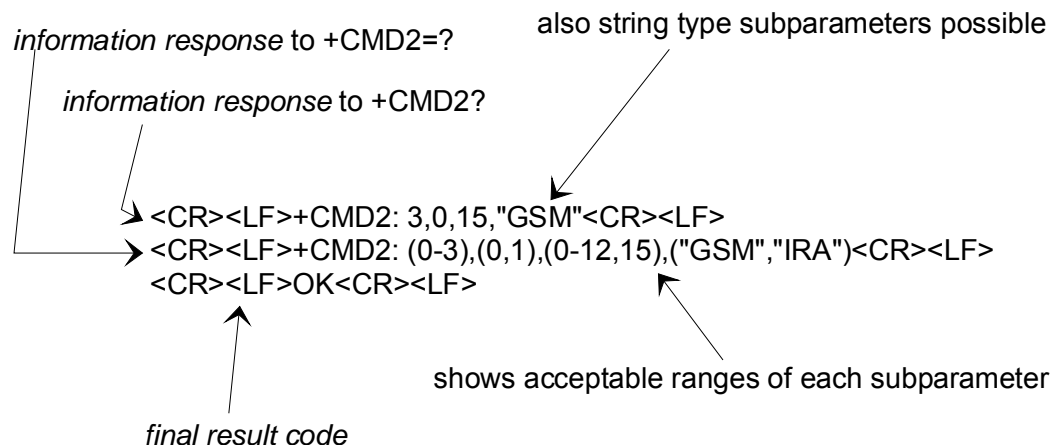
Figure 1-2 shows the basic organization format of the AT command line.

**Figure 1-2** Basic organization format the AT command line



The returned value of the AT command consists of two parts: response message and result codes. Figure 1-3 shows an example of returned value of the AT command.

**Figure 1-3** An example of returned value of the AT command



## 1.4.2 Types of AT Commands

AT commands are categorized into three types: basic commands, S register commands, and extended and vendor-defined commands.

A basic command starts with a single letter or with the & symbol plus a single letter. Table 1-1 describes the format of a basic command.

**Table 1-1** Format of a basic command

Command Format	Description
<command>[<number>]	In the command format, <b>&lt;command&gt;</b> indicates a single letter (A–Z) or the & symbol plus a single letter.  In the command format, <b>&lt;number&gt;</b> indicates a decimal number with one digit or multiple digits. The digit <b>0</b> in the forefront of <b>&lt;number&gt;</b> can be ignored.
<b>Note:</b> If a basic command that is allowed to contain <b>&lt;number&gt;</b> does not contain <b>&lt;number&gt;</b> , the default value of <b>&lt;number&gt;</b> is used in the command.  If a basic command that is not allowed to contain <b>&lt;number&gt;</b> contains <b>&lt;number&gt;</b> , "Operation not allowed" is returned.	

An S register command consists of the letter S and a decimal number, which is called the parameter number of the register. An S register command can be in the format of read command and write command. Table 1-2 describes the format of an S register command.

**Table 1-2** Format of an S register command

Command Format		Description
Read command	S<parameter number>?	Returns the ASCII code of characters currently saved in the S register. The ASCII code is expressed by a 3-digit decimal number. The digit <b>0</b> is added in the front of the number in case of insufficient digits.
Write command	S<parameter number>=<value>	Replaces the characters saved in the S register with the characters related to the value of <b>&lt;value&gt;</b> .
<b>Note:</b> If the parameter number of the register is not identified, this indicates that the command does not exist. In this case, ERROR is returned.		

All extended commands start with the + symbol. Vendor-defined commands start with a special symbol such as ^ and %. In this document, all vendor-defined commands start with the ^ or \ symbol. Extended and vendor-defined commands are further categorized into action commands and parameter commands. Table 1-3 describes the types and formats of extended and vendor-defined commands.

An action command refers to a command that performs a specific action in addition to interacting with the local parameters of the MS, including **AT+CPBR** and **AT+CMGS**. An action command may or may not contain parameters. Action commands are categorized into execution (write) command and test command. A parameter command refers to a command that interacts with the local parameters of the MS only, certain of which may affect the execution of action commands. Parameter commands are categorized into write command, read command, and test command.

**Table 1-3** Types and formats of extended and vendor-defined commands

Command Type	Command Format		Description
Action command	Execution (write) command	Contains no parameter: <name>  Contains one parameter: <name>[=<value>]  Contains multiple parameters: <name>[=<compound_value>]	In the command format, <b>&lt;compound_value&gt;</b> indicates multiple parameters that are separated by a comma. A parameter having a default value can be omitted from the command. In this case, the default value is used instead.
		<b>Note:</b> If all parameters are omitted, the = symbol following <b>&lt;name&gt;</b> should be omitted. If <b>&lt;name&gt;</b> is not identified, this command does not exist. In this case, the ERROR is returned. When <b>&lt;name&gt;</b> is identified, if a command that is not allowed to contain parameters contains parameters or a command that is allowed to contain parameters contains more parameters than the defined ones, "Operation not allowed" is returned.	
	Test command	<name>=?	A test command is executed to query the parameter range.
		<b>Note:</b> If the MS fails to identify <b>&lt;name&gt;</b> , the MS returns ERROR. If the MS can identify <b>&lt;name&gt;</b> and the contents returned by the command do not contain parameters, the MS returns OK. If the contents returned by the command contain parameters, the MS returns the available value range of each parameter, and then returns OK.	
Parameter command	Write command	Contains one parameter: <name>[=<value>]  Contains multiple parameters: <name>[=<compound_value>]	A write command is executed to set parameters.  In the command format, <b>&lt;compound_value&gt;</b> indicates multiple parameters that are separated by a comma. A parameter with a default value can be omitted from the command. In this case, the default value is used instead.
		<b>Note:</b> If all parameters are omitted, the = symbol following <b>&lt;name&gt;</b> should be omitted. If <b>&lt;name&gt;</b> is not identified, this command does not exist. In this case, ERROR is returned. When <b>&lt;name&gt;</b> is identified, if a command that is not allowed to contain parameters contains parameters or a command that is allowed to contain parameters contains more parameters than the defined ones, "Operation not allowed" is returned.	



Command Type	Command Format		Description
	Read command	<name>?	A read command is executed to read the current value of a parameter.
	Test command	<name>=?	A test command is executed to check the parameter range.
		<b>Note:</b> If the MS fails to identify <name>, the MS returns ERROR. If the MS can identify <name> and the contents returned by the command do not contain parameters, the MS returns OK. If the contents returned by the command contain parameters, the MS returns the value range of each parameter, and then returns OK.	

### 1.4.3 Abort Attributes of AT Commands

Abort means that the TE sends an instruction to abort a command when the command is being executed. An abort instruction must be sent before a command is completely executed. Therefore, the abort instruction is valid for a command whose execution consumes certain time; however, not all commands of this kind can be aborted. Whether a command can be aborted depends on the abort attribute of the command. Each AT command has its abort attribute, which is alternative. That is, the command is either abortive or not abortive. Abortive commands include certain basic commands and execution commands of action commands. Within 125 ms after the abortive commands are sent, no abort request is accepted. After 125 ms and before the commands are completely executed, if the module receives any character sent by the TE, the commands are aborted immediately.

Abortive commands are as follows:

- ATD\*99#
- ATD\*98#
- AT+CLCK
- AT+COPS commands (excluding AT+COPS=?)
- AT^MONI
- AT^MONP
- AT^SMONG

### 1.4.4 Rules for Running AT Commands

1. Each command line contains only one AT command and ends with a carriage return character. In principle, users are not allowed to run S3/S4 format modification commands. This rule is applicable to the communication between the MT and TE programs.
2. To increase the readability and regularity of command and response formats, in addition to the original interfaces specified in standards and protocols, all new interfaces must observe the following rule: No space is added to the end of



commands such as the **AT<sup>^</sup>XXX:<arg0>,<arg1>** commands, or added to the end of the <sup>^</sup> symbol, colon, and comma. No redundant space is added ahead of or to the end of a command. This rule is applicable to the communication between the MT and TE programs.

3. For an uninterruptible AT command, after sending the AT command, the TE must wait until the MT responds to the AT command before sending the second AT command. Otherwise, the second AT command sent by the TE is not executed.
4. Unless otherwise stated, all default codes between the TE and MT follow the format of GSM 7 bit Default Alphabet. For details, see section 6 in the 3GPP TS 23.038 protocol. The @ character is still transmitted as 0x00 of the 7bit coding on interfaces. Therefore, the MT and TE must be able to process the character. The MT passes the carriage return character (<CR>) and line feed character (<LF>) in a string as spaces to the TE.
5. A string refers to a byte stream that is placed inside double quotation marks, excluding the quotation marks or commas.
6. A string used by the TE to send a command cannot contain the combination of quotation marks and commas (confusing a parameter with a string). The current version does not support escape character. The code value of a data format in the UCS2 coding is reported as characters. For example, if the UCS2 code of a Chinese character is 0x553a, the 553a is reported.

A possible response sent by the MT to the TE consists of **Information text** and **Result code**, in which **Information text** is optional and **Result code** is mandatory. The format of a possible response is controlled by the ATV command. For details, see the description of the ATV Command. In this document, all possible responses listed in tables follow the ATV1 format.

## 1.5 Organization of This Document

This document consists of 16 chapters, covering the following contents:

Chapter	Describes
Chapter 1 Overall Description	The contents and organization of this document and the basic knowledge of AT command interfaces.
Chapter 2 Commands for Configuration	The AT commands used to configure the basic data of the module.
Chapter 3 Commands for Status Control	The AT commands used to control the status of the module.
Chapter 4 Commands for Serial Port Control	The AT commands used to control the serial ports of the module.
Chapter 5 Commands for Security Control	The AT commands used to control the security of the module.
Chapter 6 Commands for Identification	The AT commands used to query the identification information about the module.





Chapter	Describes
Chapter 7 Commands for Call Control	The AT commands used to control the calls on the module.
Chapter 8 Commands for Network Services	The AT commands related to the network services of the module.
Chapter 9 Commands for Data Services	The AT commands related to the data services of the module.
Chapter 10 Commands for Internet Services	The AT commands related to the internet services of the module.
Chapter 11 Commands for Short Messages	The AT commands related to the short messages of the module.
Chapter 12 Commands for the SIM Card	The AT commands related to the SIM card of the module.
Chapter 13 Commands for the Phone Book	The AT commands related to the phone book of the module.
Chapter 14 Commands for Hardware Control	The AT commands used to control the hardware of the module.
Chapter 15 Commands for Audio Control	The AT commands used to control the audio of the module.
Chapter 16 Other Commands	Other auxiliary commands
Chapter 17 Appendix	

# 2 Commands for Configuration

This chapter describes the AT commands that allow external applications to configure the basic data of the module.

## 2.1 AT&F - Command for Restoring Factory Settings

The **AT&F** command restores the module to factory settings.

**Execution command** AT&F[<value>]

**Function** Restores the related parameters to factory settings.

**Response** <CR><LF>OK<CR><LF>

### Parameter description

<value>: integer; **AT&F** is equivalent to **AT&F0**.

0: restores the current settings for AT commands to the factory settings.

**Table 2-1** List of factory settings for AT&F

Factory Settings for AT Commands	
Commands for configuration	
ATQ	<n>=0
ATV	<value>=1
AT+CFUN	<fun>=1
AT+CMEE	<errMode>=0
AT+CSCS	<chset>="GSM"
AT+SCFG	<tcpIrt>="3", <tcpMr>="10", <tcpOt>="6000", <tcpWithUrc>="on"
Commands for status control	



Factory Settings for AT Commands	
AT+CMER	<mode>=0, <keyp>=0, <disp>=0, <ind>=0, <bfr>=0
AT+CIND	<mode>=1
Commands for serial port control	
AT\Q	<n>=0
AT&C	<value>=1
AT&D	<value>=2
AT&S	<value>=0
ATE	<value>=1
Commands for network services	
AT+COPS	<format>=0
AT+CREG	<n>=0
Commands for the GPRS	
AT+CGREG	<n>=0
AT+CGSMS	<service>=3
ATS7	<n>=060
AT+CBST	<speed>=7, <name>=0, <ce>=1
AT+CRLP	<iws>=61, <mws>=61, <T1>=78, <N2>=6
AT+CR	<mode>=0
AT+CRC	<mode>=0
Commands for short messages	
AT+CMGF	<mode>=0
AT+CNMI	<mode>=0, <mt>=0, <bm>=0, <ds>=0, <bfr>=1
AT+CSMS	<service>=0
Command for the phone book	
AT+CPBS	<storage>="SM"
Other commands	
ATS3	<n>=013
ATS4	<n>=010
ATS5	<n>=008



## 2.2 AT&V - Command for Querying the Current Configuration

The **AT&V** command queries the current configuration of the module. The display of certain configuration items depends on whether the PIN code is unlocked.

<b>Execution command</b>	AT&V[<value>]
<b>Function</b>	Queries the current parameter configuration.
<b>Response</b>	<CR><LF>ACTIVE PROFILE: <CR><LF> <CR><LF>list of active profile<CR><LF>

### Parameter description

<value>: integer; **AT&V** is equivalent to **AT&V0**.

0 (default value): sequence number of the profile.

**Table 2-2** List of query results for AT&V

Examples of Results Returned by the &V Command	
PIN Locking	PIN Unlocking
ACTIVE PROFILE: E1 Q0 V1 &C1 &D2 &S0 \Q0 S3:013 S4:010 S5:008 S7:060 +CBST: 7,0,1 +CRLP: 61,61,78,6 +CR: 0 +IPR: 115200 +CMEE: 2 +CGSMS: 1  OK	ACTIVE PROFILE: E1 Q0 V1 &C1 &D2 &S0 \Q0 S3:013 S4:010 S5:008 S7:060 +CBST: 7,0,1 +CRLP: 61,61,78,6 +CR: 0 +CRC: 0 +CMGF: 0 +CNMI: 0,0,0,0,1 +IPR: 115200 +CMEE: 2 +CSMS: 0,1,1,1 +CREG: 0,1 +COPS: 0,0,"CC 460 NC 09" +CGSMS: 3  OK



## 2.3 AT&W - Command for Storing the Current Configuration

The **AT&W** command stores the current configuration of the module in the profile. The **ATZ** command restores the settings. When the **AT&W** command is used to store the current configuration information, if you restart the module without modifying the configuration information, the configuration of the module after restart is the configuration information stored by using the **AT&W** command.

<b>Execution command</b>	AT&W[<value>]
<b>Function</b>	Stores the current parameter configuration.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<value>: integer; **AT&W** is equivalent to **AT&W0**.

0 (default value): sequence number of the profile.

**Table 2-3** List of commands and parameters that can be stored by AT&W

AT Commands	
Commands for configuration	
ATQ	<n>
ATV	<value>
ATE	<value>
AT+CMEE	<errMode>
Commands for serial port control	
AT\Q	<n>
AT&C	<value>
AT&D	<value>
AT&S	<value>
ATE	<value>
Commands for network services	
AT+COPS	<format>
AT+CREG	<n>

AT Commands	
Commands for call control	
AT+CBST	<speed>, <name>, <ce>
AT+CRLP	<iws>, <mws>, <T1>, <N2>
ATS7	<n>
AT+CR	<mode>
AT+CRC	<mode>
Commands for short messages	
AT+CMGF	<mode>
AT+CNMI	<mode>,<mt>, <bm>, <ds>
AT+CSMS	<service>
Other commands	
ATS3	<n>
ATS4	<n>
ATS5	<n>

## 2.4 ATQ - Command for Controlling the Return of Execution Results

The **ATQ** command controls whether to return the execution results to the TE.

<b>Execution command</b>	ATQ[<n>]
<b>Function</b>	Controls the return of execution results.
<b>Response</b>	<ul style="list-style-type: none"> <li>In case of &lt;n&gt;=0: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li> <li>In case of &lt;n&gt;=1, no result is returned.</li> </ul>

### Parameter description

<n>: integer; **ATQ** is equivalent to **ATQ0**.

- 0 (default value): The DCE returns the execution results.
- 1: The DCE does not return the execution results.



## 2.5 ATV - Command for Setting the Formats of ME Responses

The **ATV** command sets the formats of result code and information field returned by the AT command, including the composition of head and tail. In addition, the **ATV** command sets the forms of the contents of returned result code, including numeric and verbose string forms.

**Execution command** ATV[<value>]

**Function** Sets the formats of result code and information field returned by the AT command, and the forms of the contents of returned result code.

**Response**

- In case of successful execution: <CR><LF>OK<CR><LF>
- In case of an error: <CR><LF>ERROR<CR><LF>

### Parameter description

<value>: integer; **ATV** is equivalent to **ATV0**.

- 0: The MS sends the abbreviated head and full tail, and returns the result code in numeric form.
- 1 (default value): The MS sends the full head and tail, and returns the result code in verbose string form.

**Table 2-4** Effect of ATV on response formats

	V0	V1
Returned information field	<text><CR><LF>	<CR><LF><text><CR><LF>
Returned result code	<numeric code><CR>	<CR><LF><verbose code><CR><LF>
<b>Note:</b> In the response format, <CR> indicates the S3 character; <LF> indicates the S4 character.		

**Table 2-5** List of execution results

String Format	Numeric Format	Meaning
OK	0	The command is successfully executed.
CONNECT	1	The connection is successfully set up.
RING	2	The terminal rings.
NO CARRIER	3	The connection fails to be set up or the connection is hung up.

String Format	Numeric Format	Meaning
ERROR	4	An error occurs during command execution because the command is unavailable or the command line is too long.
BUSY	7	The called user is busy.
CONNECT 2400	47	Link with 2400 bps
CONNECT 4800	48	Link with 4800 bps
CONNECT 9600	49	Link with 9600 bps

## 2.6 ATZ - Command for Restoring the Settings Saved by the User

The **ATZ** command restores the setting values saved by the user in the profile through **AT&W** to the module.

<b>Execution command</b>	ATZ[<value>]
<b>Function</b>	Restores the setting values saved by the user in the profile through <b>AT&amp;W</b> .
<b>Response</b>	<CR><LF>OK<CR><LF>

### Parameter description

<value>: integer; **ATZ** is equivalent to **ATZ0**.

0: restores the setting values saved in the profile to the module.

## 2.7 ATE - Command for Setting Echo

The **ATE** command sets whether the TA echoes the characters received from the TE when the TA is in command state.

<b>Execution command</b>	ATE[<value>]
<b>Function</b>	Sets whether the TA echoes the characters received from the TE when the TA is in command state.
<b>Response</b>	<CR><LF>OK<CR><LF>

### Parameter description



<n>: integer; **ATE** is equivalent to **ATE0**.

- 0: disables echo.
- 1 (default value): enables echo.

## 2.8 AT+CFUN - Command for Setting the Work Mode

### 2.8.1 Querying the Supported Work Modes

Test command	AT+CFUN=?
Function	Queries the work modes supported by the module.
Response	<CR><LF>+CFUN: (list of supported <fun>s), (list of supported <rst>s)<CR><LF>

#### Parameter description

<fun>: integer, which indicates the work mode to be set on the board. The values are described in the following table.

**Table 2-6** List of work modes

<fun>	Function Description	Remarks
0	Non-cyclic sleep mode	Upon wakeup, the system is switched to the state of no power saving.
1 (default value)	No power saving	
5	Cyclic sleep mode. After data processing is complete upon wakeup, the system stays in IDLE state for 2s.	
6	Cyclic sleep mode. After data processing is complete upon wakeup, the system stays in IDLE state for 10 minutes. For other tasks, after message processing is complete and the system is idle again, the system automatically enters SLEEP mode again.	
7	Cyclic sleep mode. After data processing is complete upon wakeup, the system stays in IDLE state for 2s. For other tasks, after message processing is complete and the system is idle again, the system automatically enters SLEEP mode again.	During wakeup, the serial port can work properly.



<fun>	Function Description	Remarks
8	Cyclic sleep mode. After data processing is complete upon wakeup, the system stays in IDLE state for 10 minutes. For other tasks, after message processing is complete and the system is idle again, the system automatically enters SLEEP mode again.	Same as AT+CFUN=6
9	Cyclic sleep mode. After data processing is complete upon wakeup, the system stays in IDLE state for a period (2s by default), which is configurable. AT^SCFG="PowerSaver/Mode9/Time out",<psm9to>; RTS0 and RTS1 can function as wakeup sources.	Wakeup can be activated through RTS0 and RTS1.

**Table 2-7** Relations between work modes and services

Setting Value Setvice	AT+CFUN =0	AT+CFUN=5 AT+CFUN=6	AT+CFUN=7 AT+CFUN=8	AT+CFUN=9
RTS1 activation	Quitting the current state	Without effect(RTS flow control)	Without effect(RTS flow control)	Short-term wakeup
Unsolicited report (URC)	Quitting the current state	Quitting the current state	Short-term wakeup	Short-term wakeup
Entry of AT commands on the serial port	Without effect(serial port unavailable )	Short-term wakeup	Short-term wakeup	Short-term wakeup
Arrival of short messages (the reporting is set by AT+CNMI)	Quitting the current state	Quitting the current state	Short-term wakeup	Short-term wakeup
GPRS data transmission	Without effect(serial port unavailable )	Short-term wakeup	Short-term wakeup	Short-term wakeup

Setting Value Setvice	AT+CFUN =0	AT+CFUN=5 AT+CFUN=6	AT+CFUN=7 AT+CFUN=8	AT+CFUN= 9
RTC alarm clock	Quitting the current state	Quitting the current state	Short-term wakeup	Short-term wakeup
AT+CFUN=1	Without effect (serial port unavailable )	Quitting the current state	Quitting the current state	Quitting the current state

<rst>: integer, which indicates whether the board restarts before the work mode is switched.

- 0 (default value): The board does not restart.
- 1: The board restarts.

## 2.8.2 Reading the Current Work Mode

<b>Read command</b>	AT+CFUN?
<b>Function</b>	Reads the current work mode of the module.
<b>Response</b>	<CR><LF>+CFUN: <fun><CR><LF> <CR><LF>OK<CR><LF>

## 2.8.3 Setting the Work Mode

<b>Write command</b>	AT+CFUN=[<fun>[,<rst>]]
<b>Function</b>	Sets the current work mode of the module.
<b>Response</b>	<ul style="list-style-type: none"> <li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li> <li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li> <li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR&lt;CR&gt;&lt;LF&gt;</li> </ul>

### Note:

- The work mode of the board that is configured through the write command can be saved upon power failure; AT+CFUN= is equivalent to AT+CFUN=1 (<fun>=1);
- When AT+CFUN=<fun>, 1 is set, <fun> is useless.
- During voice services, this command is invalid and "ERROR" will be returned.
- If the SIM card is not inserted, the PIN code is not activated, or the module is not registered with the network, the system will not go into the sleep mode even if it is set to a non-full-speed operation state.



## 2.9 AT^SMSO - Command for System Shutdown

### 2.9.1 Checking Whether the Command for System Shutdown Exists in the Module

<b>Test command</b>	AT^SMSO=?
<b>Function</b>	Checks whether the command for system shutdown exists in the module.
<b>Response</b>	<CR><LF>OK<CR><LF>

### 2.9.2 Setting System Shutdown

<b>Execution command</b>	AT^SMSO
<b>Function</b>	Sets ME shutdown. After the shutdown process starts, the voltage of the VDD decreases and "^SHUTDOWN" is unsolicitedly reported.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;^SMSO: MS OFF&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt; ^SHUTDOWN&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

- Do not cut off the power of the ME before the VDD voltage decreases and the "^SHUTDOWN" URC is reported. Otherwise, data may be lost.
- Other AT commands after the AT^SMSO command are not handled by the ME.

### 2.9.3 Examples

Example:

Send the command for system shutdown.

AT^SMSO

^SMSO: MS OFF

OK

^SHUTDOWN



## 2.10 AT+GCAP - Command for Querying the Transmission Capability Domain Supported by the MS

### 2.10.1 Checking Whether the Command for Querying the Transmission Capability Domain Exists in the Module

Test command	AT+GCAP=?
Function	Checks whether the command for querying the transmission capability domain exists in the module.
Response	<CR><LF>OK<CR><LF>

### 2.10.2 Listing the Transmission Capability Domain Currently Supported by the MS

Execution command	AT+GCAP
Function	Lists the transmission capability domain currently supported by the MS.
Response	<CR><LF>+GCAP: <name><CR><LF> <CR><LF>OK<CR><LF>

#### Parameter description

<name>: string; for example, **+CGSM**.

### 2.10.3 Examples

Example:

List the transmission capability domain currently supported by the MS.

AT+GCAP

+GCAP: +CGSM

OK

The returned value **+CGSM** indicates that the MS currently supports the GSM mode.



## 2.11 AT+CMEE - Command for Setting Terminal Error Reporting

### 2.11.1 Querying the Error Reporting Mode Supported by the Terminal

<b>Test command</b>	AT+CMEE=?
<b>Function</b>	Queries the terminal error reporting mode supported by the module.
<b>Response</b>	<CR><LF>+CMEE: (list of supported <errMode>s) <CR><LF> <CR><LF>OK<CR><LF>

#### Parameter description

<errMode>: integer, which indicates the terminal error reporting mode.

- 0 (default value): does not report the error code and returns ERROR only in case of an error.
- 1: reports the error by using **+CME ERROR: <err>**, in which <err> indicates the error code number.
- 2: reports the error by using **+CME ERROR: <err>**, in which <err> indicates the string value of error description.

### 2.11.2 Reading the Terminal Error Reporting Mode

<b>Read command</b>	AT+CMEE?
<b>Function</b>	Reads the terminal error reporting mode of the module.
<b>Response</b>	<CR><LF>+CMEE: <errMode><CR><LF> <CR><LF>OK<CR><LF>



## 2.11.3 Setting the Terminal Error Reporting Mode

<b>Write command</b>	AT+CME=<n>
<b>Function</b>	Sets the mode of reporting errors related to the ME by the module.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

If the error cause is unrelated to the MT, common ERROR is returned.

## 2.12 AT+CSCS - Command for Setting the TE Character Set

### 2.12.1 Querying the Character Set Supported by the TE

<b>Test command</b>	AT+CSCS=?
<b>Function</b>	Queries the character set supported by the TE.
<b>Response</b>	<CR><LF>+CSCS: (list of supported <chset>s) <CR><LF> <CR><LF>OK<CR><LF>

**Parameter description**

<chset>: string, which indicates the character set of the MS.

**Table 2-8** Character set of the MS

Value	Description
"GSM" (default value)	GSM 7bit coding (GSM 03 .38 subclause 6.2.1)
"UCS2"	16-bit universal multiple-octet coded character set (ISO/IEC10646 [32]); the UCS2 string is converted into a hexadecimal number ranging from 0000 to FFFF, for example, " <b>004100620063</b> ", which is equivalent to three 16-bit characters. The ASCII values in decimal mode are <b>65</b> , <b>98</b> , and <b>99</b> .
"IRA"	International reference character set

**Note:**

If <chset> is set to "GSM", an error may occur on software flow control (XOFF/XON).

## 2.12.2 Reading the Character Set of the TE

<b>Read command</b>	AT+CSCS?
<b>Function</b>	Reads the character set of the TE.
<b>Response</b>	<CR><LF>+CSCS: <chset><CR><LF> <CR><LF>OK<CR><LF>

## 2.12.3 Setting the Character Set of the TE

<b>Write command</b>	AT+CSCS=[<chset>]
<b>Function</b>	Sets the character set of the TE and notifies the TA of it so that the TA can properly convert the character set between the TE and MT.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

- If the interface between the TA and TE has eight bits and the character set used by the TE has seven bits, the most significant bit of the character set must be set to 0.
- In this section, AT+CSCS= is equivalent to AT+CSCS="GSM" (<chset>="GSM").



## 2.13 AT^SCFG - Extended Command for Setting Configuration Items

### 2.13.1 Querying the Configuration Items That Can Be Set by the Module

<b>Test command</b>	AT^SCFG=?
<b>Function</b>	Queries the configuration items that can be set by the module.
<b>Response</b>	<CR><LF>^SCFG: <str>s, (list of supported <value>s)<CR><LF> [<CR><LF>^SCFG: <str>s, (list of supported <value>s)<CR><LF> [...]] <CR><LF>OK<CR><LF>

#### Parameter description

<str>: string, which indicates the configurable items. For details, see Table 2-9.

<value>: indicates the configurable parameter values. For details, see Table 2-9.

**Table 2-9** List of configurable items

<str>	<value>
"PowerSaver/Mode9/Timeout"	<psm9to>
"Tcp/IRT" (which is not supported currently.)	<tcpIrt>
"Tcp/MR"	<tcpMr>
"Tcp/OT"	<tcpOt>
"Tcp/WithURCs"	<tcpWithUrc>
"URC/Datamode/Ringline"	<udri>
"URC/Ringline"	<uri>

<psm9to>: string, which indicates the duration of wakeup state in power saving mode 9 (the **AT+CFUN** command). The default value is **20**, that is, 2s. The value range is as follows:

5... 36000 The value **10** indicates 1s. The time interval is 100 ms.

<tcpIrt>: string, which indicates the waiting time for initial re-connection (IRT). The default value is **3**.

1...60 This parameter sets the waiting time (in seconds) before starting the initial re-connection in the stage of setting up initial TCP/IP connection.

<tcpMr>: integer, which indicates the maximum number of retransmissions (MR). The default value is **10**.

1... 30 Maximum number of times for retransmitting a TCP/IP data packet.

<tcpOt>: integer, which indicates the duration for link disabling. The default value is **6000**.

1...6000 Duration (in seconds) to be waited for disabling a link when a TCP/IP data packet is not acknowledged.

<tcpWithUrc>: string, which indicates whether the internet service command follows the unsolicited reporting mode or polling mode. This parameter controls whether **^SISR**, **^SISW**, and **^SIS** are unsolicitedly reported.

**Table 2-10** Values of the < tcpWithUrc > parameter

Value	Description
"on" (default value)	Enables unsolicited reporting related to the internet service command.
"off"	Disables unsolicited reporting related to the internet service command.

<udri>: indicates RING reporting in data mode. This parameter controls the reporting string in TA-TE connection hold state (such as CS data service, GPRS data service, and AT command execution).

**Table 2-11** Values of the <udri> parameter

Value	Description
"on"	Reports RING. This value is set by <urat> and <uri>.
"off" (default value)	Reports BREAK.

<uri>: string, which indicates the URC mode of the RING pin.

**Table 2-12** Values of the <uri> parameter

Value	Description
"local" (default value)	Reports RING.
"off"	Does not report RING.



## 2.13.2 Reading the Settings for Configuration Items

<b>Read command</b>	AT^SCFG?
<b>Function</b>	Reads the settings for configuration items.
<b>Response</b>	<CR><LF>^SCFG: <str>s, <value>[,<value>[,...]] <CR><LF> [<CR><LF>^SCFG: <str>s, <value>[,<value>[,...]] <CR><LF> [...]] <CR><LF>OK<CR><LF>

## 2.13.3 Setting Configuration Items

<b>Write command</b>	AT^SCFG=<str>[,<value>]
<b>Function</b>	Sets configuration items.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;^SCFG: &lt;str&gt;, &lt;value&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

## 2.14 ^SYSSTART – Command for Unsolicitedly Reporting Module Startup

This command indicates that the module is started, and can be operated.

If the adaptive baud rate is set (that is, AT+IPR=0), this command is not reported.

<b>URC</b>	<CR><LF>^SYSSTART<CR><LF>
------------	---------------------------



## 2.15 ^SHUTDOWN – Command for Unsolicitedly Reporting Module Power-off

This command indicates that the power-off process of the module is complete.

URC           <CR><LF>^SHUTDOWN<CR><LF>

# 3

## Commands for Status Control

---

This chapter describes the AT commands for controlling the status of the module.

### 3.1 AT+CMER - Command for Setting Event Reporting

The **AT+CMER** command controls the **+CIEV** unsolicited reporting that is related to **AT+SIND** and **AT+CIND** commands. For an event that is registered through **AT+SIND** and **AT+CIND** commands, if the indicator value related to the event changes, unsolicited reporting is performed.

#### 3.1.1 Querying the Supported Settings for Event Reporting

<b>Test command</b>	AT+CMER=?
<b>Function</b>	Queries the supported settings for event reporting.
<b>Response</b>	<CR><LF>+CMER: (list of supported <mode>s), (list of supported <keyp>s), (list of supported <disp>s), (list of supported <ind>s), (list of supported <bfr>s)<CR><LF> <CR><LF>OK<CR><LF>

##### Parameter description

<mode>: integer.

- 0 (default value): Unsolicited report codes (URCs) are buffered on the TA. If the buffer of the TA is full, URCs are buffered at other locations or the oldest URCs are discarded.
- 1: URCs are discarded in TA-TE connection hold state (such as data service mode). Otherwise, the event is reported directly to the TE.
- 2: 1: URCs are discarded when TA-TE link is reserved, e.g. in online data mode. Otherwise they are forwarded directly to the TE. (This is not supported currently)

<keyp>: integer; enables key event reporting, which is not supported currently.

0 Reports the event.

<disp>: integer; enables display event reporting, which is not supported currently.

0 Reports the event.

<ind>: integer; indicates event reporting.

- 0 (default value): disables event reporting.
- 1: enables event reporting; +CIEV:<ind>,<value>, in which **<ind>** indicates the event of the indicator, which is a character string.
- 2: enables event reporting; +CIEV: <ind>,<value>, in which all events occur directly between the TE and TA.

<bfr>: integer; clears the buffer.

0 Clears the buffer.

### 3.1.2 Reading the Current Settings for Event Reporting

<b>Read command</b>	AT+CMER?
<b>Function</b>	Reads the current settings for event reporting.
<b>Response</b>	<CR><LF>+CMER: <mode>,<keyp>,<disp>,<ind>,<bfr><CR><LF> <CR><LF>OK<CR><LF>

### 3.1.3 Setting the Event Reporting Mode

<b>Write command</b>	AT+CMER=[<mode>[,<keyp>[,<disp>[,<ind>[,<bfr>]]]]]
<b>Function</b>	Sets the event reporting mode.
<b>Response</b>	<ul style="list-style-type: none"> <li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li> <li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li> <li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li> </ul>

**Note:**

If no parameters of this command are set, AT+CMER= considers the previously set values valid for various parameters.

## 3.2 AT+CIND - Command for Controlling Indication Events

The **AT+CIND** command controls the mode of reporting indication events for certain functions, including battery power level, signal strength, service availability, unread short message indicator, and full short message storage.



## 3.2.1 Querying the Supported Indication Events and Indication Status

Test command	AT+CIND=?
Function	Queries the supported indication events and the indication status.
Response	<CR><LF>+CIND: (<indDescr>, list of supported <indvalue>s)[, (<indDescr>, list of supported <indvalue>s)[, ...]]<CR><LF> <CR><LF>OK<CR><LF>

### Parameter description

<indValue>: integer; indication event, corresponding to the value of <indDescr>.

<indDescr>: string; indication status; Table 3-1 describes the values of the parameter.

**Table 3-1** Values of the <indDescr> and <indValue> parameters

<indDescr>	<indValue>
"battchg": battery power level indicator. Currently, only the value <b>5</b> is supported.	0: has not been connected to any charger.
	1: has been connected to a charger.
	2: being charged.
	3: The charge process is complete.
	4: The charge process is interrupted due to an error.
	5: unknown.
"signal": receive signal bit error rate indicator. Currently, only the value <b>99</b> is supported.	0–7: correspond to the values of <b>RXQUAL</b> in the GSM 05.08 section 8.2.4.
	99: unknown.
"service": network service status indicator.	0: has not been registered with any network.
	1: has been registered with the home network. When "roam"=1, the MT has been registered with another network.
"sounder": audio status indicator, which indicates an event with ring. Currently, only the value <b>0</b> is supported.	0: without ring.
	1: with ring.
"message": unread short message indicator.	0: without unread short message.
	1: with unread short message.
"call": conversation status indicator.	0: without conversation.
	1: ongoing conversation or conversation hold.

<indDescr>	<indValue>
"roam": roaming indicator.	0: registers with the home network or does not register with any network.
	1: registers with the roaming network.
"smsfull": short message storage full indicator.	0: The short message storage media is not full.
	1: The short message storage media is full.
"rssi": receive signal strength indicator.	0: $\leq -112$ dBm
	1–4: The strength interval is 15 dBm.
	5: $\geq -51$ dBm
	99: unknown or unmeasurable.

### 3.2.2 Reading the Current Indication Status

<b>Read command</b>	AT+CIND?
<b>Function</b>	Reads the current indication status.
<b>Response</b>	<CR><LF>+CIND: <indValue>[, <indValue>[, ...]] <CR><LF> <CR><LF>OK<CR><LF>

### 3.2.3 Setting Whether to Report Indication Events

<b>Write command</b>	AT+CIND=<mode>[, <mode>[, <mode>...]]
<b>Function</b>	Sets whether to report indication events.
<b>Response</b>	<ul style="list-style-type: none"> <li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li> <li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li> <li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt; +CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li> </ul>

#### Parameter description

<mode>: integer. This parameter controls whether to report a single indication event.

0: deregisters indication event and disables event reporting.

1 (default value): registers indication event and enables event reporting.



### 3.2.4 Examples

Example 1:

Query the supported indication event and its indication status.

```
^SYSSTART
```

```
AT+CPIN=1111
```

```
OK
```

```
AT+CIND=?
```

```
+CIND: (battchg,(0-5)),(signal,(0-7,99)),(service,(0-1)),(sounder,(0-1)),(message,(0-1)),(call,(0-1)),(roam,(0-1)),(smsfull,(0-1)),(rssi,(0-5,99))
```

```
OK
```

Example 2:

Read the current indication status.

```
AT+CIND?
```

```
+CIND: 5,99,1,0,0,0,0,4
```

```
OK
```

## 3.3 AT^SIND - Extended Command for Controlling Indication Events

The **AT^SIND** command controls the mode of reporting indication events for certain functions. The **AT^SIND** command can control more indication events than the **AT+CIND** command, including the events that can be controlled by the **AT+CIND** command.

### 3.3.1 Querying the Supported Report Events

<b>Test command</b>	AT^SIND=?
<b>Function</b>	Queries the supported report events.
<b>Response</b>	<CR><LF>^SIND: (<indDescr>, list of supported <indvalue>s)[, (<indDescr>, list of supported <indvalue>s)[, ...]]<CR><LF> <CR><LF>OK<CR><LF>

#### Parameter description

<indValue>: integer, which corresponds to the value of <inddescr>.

<indDescr>: string; Table 3-2 describes the values of the parameter.

**Table 3-2** Values of the <indDescr> and <indValue> parameters

<indDescr>	<indValue>
"battchg": battery power level indicator. Currently, only the value <b>5</b> is supported.	0: has not been connected to any charger.
	1: has been connected to a charger.
	2: being charged.
	3: The charge process is complete.
	4: The charge process is interrupted due to an error.
	5: unknown.
"signal": receive signal bit error rate indicator. Currently, only the value <b>99</b> is supported.	0: $\leq -113$ dBm
	1: $-111$ dBm
	2–30: $-109$ dBm to $-53$ dBm
	31: $\geq -51$ dBm
	99: unknown.
"service": network service status indicator.	0: has not been registered with any network.
	1: has been registered with the home network. When "roam"=1, the MT has been registered with another network.
"sounder": audio status indicator, which indicates an event with ring. Currently, only the value <b>0</b> is supported.	0: without ring.
	1: with ring.
"message": unread short message indicator.	0: without unread short message.
	1: with unread short message.
"call": conversation status indicator.	0: without conversation.
	1: ongoing conversation or conversation hold.
"roam": roaming indicator.	0: registers with the home network or does not register with any network.
	1: registers with the roaming network.
"smsfull": short message storage full indicator.	0: The short message storage media is not full.
	1: The short message storage media is full.
"rssi": receive signal strength indicator.	0: $\leq -112$ dBm
	1–4: The strength interval is 15 dBm.
	5: $\geq -51$ dBm

<indDescr>	<indValue>
	99: unknown or unmeasurable.
“ciphcall”: encryption status change indicator. This indicator may be disabled by the EFad (administrative data) file data of the SIM card.	0: Short messages are not encrypted.
	1: Short messages are encrypted.
"eons": Enhanced Operator Name String (EONS) indicator. The presentation of the "eons" indicator is determined by network activities. For example, the indicator appears every time a location update occurs or a NITZ message is sent, no matter whether or not the status of the EONS message has changed. The EONS tables are stored in the SIM card and will be read at power-up. 0–5 indicates the priority of the operator name source (GSM 22.101).	0: Not registered
	1: EF-OPL, EF-PNN (the longest character: 24)
	2: Long and short string format, Common PCN Handset Specification(CPHS)
	3: Operator name with NITZ message. Short string format only display when the EFopshort of CPHS is usable.
	4: Operator name with ME stored.
	5: Broadcast MCC-MNC (digital format)
“nitz”: network and time zone indicator. When the network or time zone with which the MT registers changes, the network sends a time indicator.	The related parameters are <nitzUT>, <nitzTZ>, and <nitzDST>.

### 3.3.2 Reading the Current Event Reporting Mode

**Read command** AT^SIND?

**Function** Reads the current event reporting mode.

**Response**

- In case of successful execution: <CR><LF>^SIND: <indDescr>,<mode>,<indValue>[^SIND: <indDescr>,<mode>,<indValue>[...]] <CR><LF> <CR><LF>OK<CR><LF>
- In case of an error: <CR><LF>ERROR <CR><LF>
- In case of an error related to the MT: <CR><LF>+CME ERROR: <err><CR><LF>

#### Parameter description

<mode>: integer. This parameter controls the reporting of a single event.

- 0: disables event reporting.
- 1: enables event reporting.
- 2: queries the settings for event reporting.

### 3.3.3 Setting the Event Reporting Mode

**Write command** AT^SIND=<indDescr>,<mode>

**Function** Sets the event reporting mode.

**Response**

- In case of successful execution: <CR><LF>^SIND:<indDescr>,<mode>,<indValue><CR><LF>  
When <indDescr>="nitz" and <mode>=2:  
<CR><LF>^SIND:<indDescr>,<mode>,<nitzUT>,<nitzTZ>,<nitzDST><CR><LF>  
<CR><LF>OK<CR><LF>
- In case of an error: <CR><LF>ERROR <CR><LF>
- In case of an error related to the MT: <CR><LF>+CME ERROR:<err><CR><LF>

#### Parameter description

<nitzUT>: time information.

<nitzTZ>: time zone information.

<nitaDST>: daylight saving time for adaptive NITZ indicator.

## 3.4 AT+WS46 - Command for Selecting a Radio Network

The **AT+WS46** command sets and queries the radio network of a standard with which the ME registers.

### 3.4.1 Querying the Supported Radio Networks

**Test command** AT+WS46=?

**Function** Queries the supported radio networks.

**Response** <CR><LF> (list of supported <n>s) <CR><LF>  
<CR><LF>OK<CR><LF>

#### Parameter description

<n>: integer; **AT+WS46=** is equivalent to **AT+WS46=12**.

12: GSM digital cellular network.



### 3.4.2 Reading the Current Radio Network

<b>Read command</b>	AT+WS46?
<b>Function</b>	Reads the current radio network.
<b>Response</b>	<CR><LF><n><CR><LF> <CR><LF>OK<CR><LF>

### 3.4.3 Setting the Radio Network to Be Registered

<b>Write command</b>	AT+WS46=[<n>]
<b>Function</b>	Sets the radio network to be registered.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

## 3.5 +CIEV – Command for Indicating the Status Change

When the status of relevant event set by using **AT+CIND** or **AT^SIND** is changed, the MT unsolicitedly reports +CIEV.

<b>URC1</b>	Reports with the standard format. <CR><LF>+CIEV: <indDescr>,<indValue>1[,<indValue>2]<CR><LF>
<b>URC2</b>	Reports with the "nitz" indication format. <CR><LF>+CIEV: <indDescr>,<nitzUT>,<nitzTZ>,<nitzDST><CR><LF>
<b>Function</b>	Indicates that the status of the event registered by using AT+CMER is changed.

#### Parameter description

Refer to the parameter descriptions of **AT+CMER**, **AT+CIND**, and **AT^SIND** commands.

# 4 Commands for Serial Port Control

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This chapter describes the AT commands for controlling the serial ports of the module.

## 4.1 AT\Q - Command for Enabling Software or Hardware Flow Control

The **AT\Q** command sets the flow control mode.

**Execution command** AT\Q[<n>]

**Function** Sets the flow control mode.

**Response**

- In case of successful execution: <CR><LF>OK<CR><LF>
- In case of not supporting RTS/CTS when n = 2 or 3:  
<CR><LF>ERROR<CR><LF>

**Note:**

- Hardware flow control is recommended, especially for the data service and multiplexing.
- In the case of CSD data service, hardware flow control must be adopted.

**Parameter description**

<n>: integer, which is not saved upon power failure; **AT\Q** is equivalent to **AT\Q0**.

- 0 (default value): disables flow control.
- 1: XON/XOFF software flow control.
- 2: Only CTS by DCE(TA).
- 3: RTS/CTS hardware flow control.

## 4.2 AT&C - Command for Setting the DCD Usage State

The **AT&C** command sets the relation between the status of the DCD line and signal detection of the remote receiving line.

<b>Execution command</b>	AT&C[<value>]
<b>Function</b>	Sets the relation between the status of the DCD line and signal detection of the remote receiving line.
<b>Response</b>	<CR><LF>OK<CR><LF>

#### Parameter description

<value>: integer; **AT&C** is equivalent to **AT&C0**.

- 0: enables the DCD line.
- 1 (default value): The DCD line is enabled only when data carrier exists.

## 4.3 AT&D - Command for Setting the DTR Usage State

The **AT&D** command sets the result returned by the TA in data service state when the DTR circuit is disabled from enabling state.

<b>Execution command</b>	AT&D[<value>]
<b>Function</b>	Sets the result returned by the TA in data service state when the DTR circuit is disabled from enabling state.
<b>Response</b>	<CR><LF>OK<CR><LF>

#### Parameter description

<value>: integer; **AT&D** is equivalent to **AT&D0**.

- 0: The TA ignores the status of the DTR circuit.
- 1: enters the command mode while holding the current data conversation.
- 2 (default value): releases the data conversation and enters the command mode. When **DTR=OFF**, automatic response is disabled.

## 4.4 AT&S – Command for Setting the DSR Usage State

The **AT&S** command sets the status of the DSR line according to different communication status of the ME.

<b>Execution command</b>	AT&S[<value>]
<b>Function</b>	Sets the status of the DSR line.
<b>Response</b>	<CR><LF>OK<CR><LF>

**Parameter description**

<value>: integer; **AT&S** is equivalent to **AT&S0**.

- 0 (default value): The DSR is always valid.
- 1: When the ME is in command mode, the DSR is invalid. When the ME is in data mode, the DSR is valid.

## 4.5 AT+IPR - Command for Setting the Baud Rate of the DTE-DCE

The **AT+IPR** command sets the baud rate of the DTE-DCE.

### 4.5.1 Querying the Supported Baud Rates of the DTE-DCE

<b>Test command</b>	AT+IPR=?
<b>Function</b>	Queries the supported baud rates of the DTE-DCE.
<b>Response</b>	<CR><LF>+IPR: (list of supported auto-detectable <rate>s)[,(list of supported fixed-only <rate>s)]<CR><LF> <CR><LF>OK<CR><LF>

**Parameter description**

<rate>: integer, which is saved upon power failure.

0: indicates adaptive baud rate.

Range of baud rate adaptation: **1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200**.

Fixed baud rate: 600, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 57600, 115200, and 230400.

Default value: **115200**.

### 4.5.2 Reading the Current Baud Rate of the DTE-DCE

<b>Read command</b>	AT+IPR?
<b>Function</b>	Reads the current baud rate of the DTE-DCE.
<b>Response</b>	<CR><LF>+IPR: <rate><CR><LF> <CR><LF>OK<CR><LF>



### 4.5.3 Setting the Baud Rate of the DTE-DCE

<b>Write command</b>	AT+IPR=<rate>
<b>Function</b>	Sets the baud rate of the DTE-DCE.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR:&lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

- To set an adaptive baud rate, run AT+IPR=0.
- To set a fixed baud rate, ensure that the baud rates configured for the TE and TA are the same.
- When running the at command to set baud rate adaptation, ensure that AT ahead of the command is in upper case.
- After baud rate adaptation is enabled, if you want to change the baud rate of Application Procession, do the following: Set the baud rate, disable and enable the serial port or change the state of DTR (the interval between changing the status of the serial port or the DTR must be over two seconds), and then synchronize the serial port with capital "AT" in the command..
- In multiplexing mode, a baud rate higher than 115200 bit/s is recommended

## 4.6 AT+CMUX - Command for Setting Multiplexing

The **AT+CMUX** command enables or disables the multiplexing function.

### 4.6.1 Querying the Supported Settings for Multiplexing

<b>Test command</b>	AT+CMUX=?
<b>Function</b>	Queries the supported settings for multiplexing.
<b>Response</b>	<CR><LF>+CMUX: (list of supported <mode>s) , (list of supported <subset>s),(list of supported <port_speed>s),(list of supported <N1>s),(list of supported <T1>s),(list of supported <N2>s),(list of supported <T2>s),(list of supported <T3>s),(list of supported <k>s)<CR><LF> <CR><LF>OK<CR><LF>

**Parameter description**

<mode>: integer, which indicates the mode when the MUX is enabled. This parameter is saved upon power failure. Currently, only the value **0** is supported.

- 0 (default value): basic mode
- 1: enhanced mode

<subset>: integer, which is saved upon power failure. This parameter is not supported currently.

- 0 (default value): UIH frames used only
- 1: UI frames used only

<port\_speed>: integer, which is not supported currently.

- 1: 9600 bit/s
- 2: 19200 bit/s
- 3: 38400 bit/s
- 4: 57600 bit/s
- 5 (default value): 115200 bit/s
- 6: 230400 bit/s
- 7: 460800 bit/s
- 8: 921600 bit/s

<N1>: integer, which indicates the maximum frame length; value range: 1–32768; the default value is **31** (or **64** in case of enhanced mode); this parameter is saved upon power failure and is not supported currently.

<T1>: integer, which indicates the reception acknowledgement timer; value range: 1–255; the value **1** indicates 10 ms; the default value is **10** (100 ms). This parameter is saved upon power failure and is not supported currently.

<N2>: integer, which indicates the maximum number of re-connections; value range: 0–100; the default value is **3**. This parameter is saved upon power failure and is not supported currently.

<T2>: integer, which indicates the response timer for multiple control channels; value range: 2–255; the value **2** indicates 20 ms; the default value is **30**. This parameter is saved upon power failure and is not supported currently.

<T3>: integer, which indicates the wakeup response timer; value range: 1–255; the value **1** indicates 1s; the default value is **10**. This parameter is saved upon power failure and is not supported currently.

<k>: integer, which indicates the window size (used for the enhanced mode that supports error recovery); value range: 1–7; the default value is **2**. This parameter is saved upon power failure and is not supported currently.



## 4.6.2 Reading the Current Settings for Multiplexing

<b>Read command</b>	AT+CMUX?
<b>Function</b>	Reads the current settings for multiplexing.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CMUX : &lt;mode&gt;,&lt;subset&gt;,&lt;port_speed&gt;,&lt;N1&gt;,&lt;T1&gt;,&lt;N2&gt;,&lt;T2&gt;,&lt;T3&gt;,&lt;k&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

## 4.6.3 Setting Multiplexing

<b>Write command</b>	AT+CMUX=<mode>,<subset>,<port_speed>,<N1>,<T1>,<N2>,<T2>,<T3>,<k>
<b>Function</b>	Sets multiplexing.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

- All channels have the same baud rate, which is controlled by the IPR.
- Currently, a maximum of three channels are supported.
- In case of multiplexing, baud rate adaptation is not supported. On the contrary, if baud rate adaptation is enabled, multiplexing is unavailable.
- In case of multiplexing, software flow control is not supported.
- The TE side must use the Multi-TA tool provided by NXP.



# 5 Commands for Security Control

This chapter describes the AT commands that allow external applications to configure different security-based policies of the module.

## 5.1 AT+CPIN - Command for PIN Management

The **AT+CPIN** command identifies networks.

### 5.1.1 Checking Whether a PIN Management Command Exists

<b>Test command</b>	AT+CPIN=?
<b>Function</b>	Check whether a PIN management command exists.
<b>Response</b>	<CR><LF>OK<CR><LF>

### 5.1.2 Reading the Password Entry Request

<b>Read command</b>	AT+CPIN?
<b>Function</b>	Reads the current authentication status of the SIM card.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CPIN: &lt;code&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

Code: string without quotation marks. Table 5-1 describes PIN authentication performed by the SIM card.

**Table 5-1** PIN authentication performed by the SIM card

Value	Description
READY	The PIN code has been entered and the SIM card has completed PIN authentication.
SIM PIN	The ME is waiting for the entry of SIM PIN code.
SIM PUK	After the SIM PIN code is improperly entered for three times, the ME is waiting for the entry of SIM PUK code.
SIM PIN2	The ME is waiting for the entry of SIM PIN2 code.
SIM PUK2	After the SIM PIN2 code is improperly entered for three times, the ME is waiting for the entry of SIM PUK2 code.

### 5.1.3 Responding to the Password Entry Request

<b>Write command</b>	AT+CPIN=<pin>[,<newpin>]
<b>Function</b>	<p>Checks and unlocks the PIN and PIN2.</p> <p>If the current password entry request is PIN or PIN2, run the following command:</p> <p>AT+CPIN=&lt;pin&gt;</p> <p>If the current password entry request is PUK or PUK2, run the command:</p> <p><b>AT+CPIN=&lt;pin&gt;,&lt;newpin&gt;</b></p> <p>The first parameter <b>&lt;pin&gt;</b> indicates the SIM PUK or SIM PUK2. The second parameter <b>&lt;newpin&gt;</b> indicates the new PIN or PIN2 code.</p>
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

If no PIN entry request exists currently, running this command returns an error message:  
+CME ERROR: operation not allowed;

If PIN or PUK is checked during an ongoing call or other services, the call may be hung up or other services may be interrupted.

**Parameter description**

<pin>, <newpin>: A string, which can be or may not be placed inside quotation marks. The characters inside the string must be obtained from '0'-'9'. Otherwise, an error is returned directly.

### 5.1.4 Examples

Example 1:

Enter the PIN code for unlocking.

AT+CPIN?

+CPIN: SIM PIN

OK

A PIN code entry request exists.

AT+CPIN="1234"

OK

Enter the PIN code.

Example 2:

Enter the PUK code for unlocking and modify the PIN code.

AT+CPIN?

+CPIN: SIM PUK

A PUK code entry request exists.

OK

AT+CPIN="12345678","1234"  
code.

Enter the PUK code and modify the PIN

OK

## 5.2 AT+CLCK - Command for Locking and Unlocking the Device

The **AT+CLCK** command locks and unlocks the device.

### 5.2.1 Checking the Devices Supported by This Command

**Test command** AT+CLCK=?

**Function** Returns the devices supported by this command.

**Response** <CR><LF>+CLCK: (list of supported <fac>s)<CR><LF>  
<CR><LF>OK<CR><LF>

#### Parameter description

<fac>: string, which specifies the object on which this command operation is performed.

- "SC": SIM card. If the SIM card is locked, the MS requests you to enter the password during power-on. The password is the SIM PIN1 code.
- "AO": forbids all outgoing calls; this parameter is reserved and is not supported currently.
- "OI": forbids outgoing international calls; this parameter is reserved and is not supported currently.

- “OX”: forbids outgoing international calls excluding the calls originated to the home country; this parameter is reserved and is not supported currently.
- “AI”: forbids all outgoing calls; this parameter is reserved and is not supported currently.
- “IR”: forbids all incoming calls when the MS roams outside the home country. This parameter is reserved and is not supported currently.
- “AB”: forbids all services; this parameter is reserved and is not supported currently.
- “AG”: forbids all outgoing calls; this parameter is reserved and is not supported currently.
- “AC”: forbids all incoming calls; this parameter is reserved and is not supported currently.
- “FD”: The SIM card locks the dialing memory. This parameter is reserved and is not supported currently.
- “PN”: network customization. This parameter is reserved and is not supported currently.
- “PU”: subnet customization. This parameter is reserved and is not supported currently.
- “PP”: customized by service providers. This parameter is reserved and is not supported currently.

## 5.2.2 Locking and Unlocking the Device

**Write command** +CLCK=<fac>,<mode>[,<passwd>[,<class>]]

**Function** Locks and unlocks the MT or network functions, and queries the locking status.

**Response**

- In case of successful execution:  
When <mode>=2  
<CR><LF>+CLCK: <status><CR><LF>  
<CR><LF>OK<CR><LF>  
When <mode>≠2: <CR><LF>OK<CR><LF>
- In case of an error related to the MT: <CR><LF>+CME ERROR: <err><CR><LF>

### Parameter description

<mode>: integer, which indicates the operation mode.

- 0: unlocks the device.
- 1: locks the device.
- 2: queries the status.

<status>: integer, which indicates the current status.

- 0: inactive
- 1: active

<passwd>: string, which can be or may not be placed inside quotation marks. This parameter corresponds to the password of **<fac>** and can be modified through **+CPWD**. When **mode** is set to **0** or **1**, this parameter is mandatory. When **mode** is set to **2**, no password is required. The characters inside the string must be obtained from '0'-'9'. Otherwise, an error is returned directly.

<class>: integer, which indicates the service type.

- 1: voice call (not supported currently)
- 2: data
- 4: fax (not supported currently)
- 7: voice+data+fax (not supported currently)

## 5.2.3 Examples

Example 1:

Lock the SIM card.

```
AT+CLCK="SC",1,"1234"
```

OK

Example 2:

Unlock the SIM card.

```
AT+CLCK="SC",0,"1234"
```

OK

Example 3:

Query the locking status of the SIM card.

```
AT+CLCK="SC",2
```

```
+CLCK: 0
```

OK

## 5.3 AT+CPWD - Command for Modifying the Password

The **AT+CPWD** command modifies the password.



### 5.3.1 Checking the Devices Supported by This Command

<b>Test command</b>	AT+CPWD=?
<b>Function</b>	Returns the devices supported by this command and the maximum length of passwords corresponding to the devices.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CPWD: list of supported (&lt;fac&gt;,&lt;pwdlength&gt;)s&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<fac> string, which specifies the object on which this command operation is performed.

- "P2": PIN2 of the SIM card.
- "SC": SIM card. If the SIM card is locked, the MS requests you to enter the password during power-on.
- "AO": forbids all outgoing calls; this parameter is reserved and is not supported currently.
- "OI": forbids outgoing international calls; this parameter is reserved and is not supported currently.
- "OX": forbids outgoing international calls excluding the calls originated to the home country; this parameter is reserved and is not supported currently.
- "AI": forbids all outgoing calls; this parameter is reserved and is not supported currently.
- "IR": forbids all incoming calls when the SIM card roams outside the home country. This parameter is reserved and is not supported currently.
- "AB": forbids all services; this parameter is reserved and is not supported currently.

<pwdlength>: string, which indicates the maximum length of the password corresponding to the locking function of the device.

### 5.3.2 Modifying the Password

This command modifies the password that corresponds to the locking function of the device.

<b>Write command</b>	AT+CPWD=<fac>,<oldpwd>,<newpwd>
<b>Function</b>	Modifies the password (such as PIN) that corresponds to the locking function of the device.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<oldpwd>,<newpwd>: old password and new password; string; the maximum length of password is specified by the **<pwdlength>** parameter; the characters inside the string must be obtained from '0'–'9'. Otherwise, an error is returned directly.

### 5.3.3 Examples

Example:

Run **AT+CPWD** to modify the PIN code.

AT+CLCK="SC",2  
card.

Query the locking status of the SIM

+CLCK:0

OK

AT+CLCK="SC",1,"1234"  
state.

Set the SIM card to the PIN locking

OK

AT+CPWD="SC","1234","1111"

Modify the PIN code.

OK

# 6 Commands for Identification

---

This chapter describes the AT commands that allow external applications to obtain the identification information about the module or about the entities that connect to the module.

## 6.1 ATI - Command for Querying the Product Information

The **ATI** command queries the product information, including the vendor information (**+CGMI**), product model number (**+CGMM**), software version number (**+CGMR**), ESN/IMEI (**+CGSN**), and capability list (**+GCAP**).

**Execution command**    **ATI**[<value>]

**Function**            Queries the product information.

**Response**            [<CR><LF>Manufacture: ...  
                          <CR><LF>Model: ...  
                          <CR><LF>Revision: ...  
                          <CR><LF>IMEI: ...  
                          <CR><LF>GCAP: ...<CR><LF>]]]]]  
                          <CR><LF>OK<CR><LF>

### Parameter description

<Value>: integer; **ATI** is equivalent to **ATI0**.

(default value): MS information

0: reserved

1: reserved

2: reserved

3: vendor ID and product model number

4: vendor ID



5: reserved

6: reserved

### 6.1.1 Examples

Example 1:

Send the **ATI** command.

ATI

Manufacture: HUAWEI

Model: MG323

Revision: 11.810.01.00.00

IMEI: 350050500005492

+GCAP: +CGSM

OK

Example 2:

Send the **ATI4** command.

ATI4

HUAWEI MG323

OK

Example 3:

Send the **ATI5** command.

ATI5

HUAWEI

OK

## 6.2 AT+CGMI/GMI - Command for Querying the Vendor Information

The **AT+CGMI/GMI** command queries the information about the module vendor.



## 6.2.1 Checking Whether the Command for Querying the Vendor Information Exists

<b>Test command</b>	AT+CGMI=? or AT+GMI=?
<b>Function</b>	Checks whether the command for querying the vendor information exists.
<b>Response</b>	<CR><LF>OK<CR><LF>

## 6.2.2 Querying the Vendor Information Request

<b>Execution command</b>	AT+CGMI or AT+GMI
<b>Function</b>	Queries the vendor information.
<b>Response</b>	<CR><LF><manufacture><CR><LF> <CR><LF>OK<CR><LF>

### Parameter description

<manufacture>: string, which indicates the vendor information.

"HUAWEI"

## 6.2.3 Examples

Query the vendor information.

AT+CGMI

HUAWEI

OK

AT+GMI

HUAWEI

OK

## 6.3 AT+CGMM/GMM - Command for Querying the Product Model

The **AT+CGMM/GMM** command queries the product model.

### 6.3.1 Checking Whether the Command for Querying the Product Model Exists

<b>Test command</b>	AT+CGMM=? or AT+GMM=?
<b>Function</b>	Checks whether the command for querying the product model exists.
<b>Response</b>	<CR><LF>OK<CR><LF>

### 6.3.2 Querying the Product Model Number Request

<b>Execution command</b>	AT+CGMM or AT+GMM
<b>Function</b>	Queries the product model number.
<b>Response</b>	<CR><LF><model><CR><LF> <CR><LF>OK<CR><LF>

#### Parameter description

<model>: string, which indicates the product model number.

"MG323"

### 6.3.3 Examples

Example:

Query the product model number.

AT+CGMM

MG323

OK

AT+GMM

MG323

OK



## 6.4 AT+CGMR/GMR - Command for Querying the Software Version Number

The **AT+CGMR/GMR** command queries the software version number of the module.

### 6.4.1 Checking Whether the Command for Querying the Software Version Number Exists

<b>Test command</b>	AT+CGMR=? or AT+GMR=?
<b>Function</b>	Checks whether the command for querying the software version number exists.
<b>Response</b>	<CR><LF>OK<CR><LF>

### 6.4.2 Querying the Software Version Number

<b>Execution command</b>	AT+CGMR or AT+GMR
<b>Function</b>	Queries the software version number.
<b>Response</b>	<CR><LF><softversion><CR><LF> <CR><LF>OK<CR><LF>

#### Parameter description

<softversion>: string, which indicates the software version number.

### 6.4.3 Examples

Example:

Query the software version number.

AT+CGMR

11.810.01.00.00

OK

AT+GMR

11.810.01.00.00

OK



## 6.5 AT+CGSN/GSN - Command for Querying the IMEI

The **AT+CGSN/GSN** command queries the IMEI of the module.

### 6.5.1 Checking Whether the Command for Querying the IMEI Exists

<b>Test command</b>	AT+CGSN=? or AT+GSN=?
<b>Function</b>	Checks whether the command for querying the IMEI exists.
<b>Response</b>	<CR><LF>OK<CR><LF>

### 6.5.2 Querying the IMEI

<b>Execution command</b>	AT+CGSN or AT+GSN
<b>Function</b>	Queries the IMEI of the module.
<b>Response</b>	<CR><LF><sn><CR><LF> <CR><LF>OK<CR><LF>

#### Parameter description

<sn>: string, which indicates the IMEI of the board. Table 6-1 lists the composition of the IMEI.

**Table 6-1** Composition of the IMEI

8 char	6 char	1 char
TAC	SNR	Spare

TAC: type code assigned to the device

SNR: sequence number of the device

Spare: reserved

### 6.5.3 Examples

Example:

Query the IMEI.

AT+CGSN

350050500005492



OK  
AT+GSN  
350050500005492

OK

## 6.6 AT+CIMI - Command for Querying the IMSI

The **AT+CIMI** command queries the IMSI of the SIM card.

### 6.6.1 Checking Whether the Command for Querying the IMSI Exists

<b>Test command</b>	AT+CIMI=?
<b>Function</b>	Checks whether the command for querying the IMSI exists.
<b>Response</b>	<CR><LF>OK<CR><LF>

### 6.6.2 Querying the IMSI

<b>Execution command</b>	AT+CIMI
<b>Function</b>	Queries the IMSI of the SIM card.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;&lt;imsi&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<imsi>: string, which indicates the IMSI of the SIM card. The IMSI is a string that consists of decimal numbers ranging from 0 to 9. Table 6-2 lists the composition of the IMSI.

**Table 6-2** Composition of the IMSI

3 char	2 or 3 char	
MCC	MNC	MSIN



3 char	2 or 3 char	
<b>Note:</b> The IMSI consists of not more than 15 characters in total.		

MCC: Mobile Country Code

MNC: Mobile Network Code

MSIN: Mobile Station Identification Number

## 6.6.3 Examples

Example:

Query the IMSI.

AT+CIMI

46009755200774

OK

# 7

## Commands for Call Control

This chapter describes the AT commands that are related to the calling and called parties of the data service.

### 7.1 ATD - Command for Originating a Call

The **ATD** command originates a voice call or a CSD data service. For originating a voice call, the command ends with ";". For establishing a data service connection, the command ends without ";".

<b>Execution command</b>	ATD<dialstring>[:]
<b>Function</b>	Originates voice call or CSD data services.
<b>Response</b>	<p>When originating a voice call</p> <ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li></ul> <p>or &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</p> <ul style="list-style-type: none"><li>• In case of failed link establishment: &lt;CR&gt;&lt;LF&gt;NO CARRIER&lt;CR&gt;&lt;LF&gt;</li></ul> <p>or &lt;CR&gt;&lt;LF&gt;NO ANSWER&lt;CR&gt;&lt;LF&gt;</p> <ul style="list-style-type: none"><li>• If the called party is busy: &lt;CR&gt;&lt;LF&gt;BUSY&lt;CR&gt;&lt;LF&gt;</li></ul> <p>When establishing a CSD data service connection</p> <ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;CONNECT[&lt;text&gt;]&lt;CR&gt;&lt;LF&gt;</li><li>• In case of failure in establishing the connection: &lt;CR&gt;&lt;LF&gt;NO CARRIER&lt;CR&gt;&lt;LF&gt;</li><li>• If the called party is busy: &lt;CR&gt;&lt;LF&gt;BUSY&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<dialstring>: the telephone number of the called party. "1, 2, 3, 4, 5, 6, 7, 8, 9, 0, \*, #, +, A, B, C, D, P, T, W, @, !" are allowed for this parameter, but of which "T, P, D, !, @" will be ignored.



## 7.2 ATD\*99# - Command for Requesting the GPRS Service

The **ATD\*99#** command establishes a communication link between the TE and Public Data Network (PDN). After the **ITU-T V.250 'D'** (dialing) command is executed, the MT enters the ITU-T V.250 online data state and starts the specified layer-2 protocol jointly with the TE. Other AT commands following this command line are not executed. After the MT enters the online data state, its detailed behaviors depend on the type of Packet Data Protocol (PDP).

<b>Execution command</b>	ATD*99[*[<called_address>[[*[<L2P>][*[<cid>]]]]]]#
<b>Function</b>	Establishes a communication link between the TE and PDN.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;CONNECT&lt;CR&gt;&lt;LF&gt;</li><li>• In case of failed link establishment: &lt;CR&gt;&lt;LF&gt;NO CARRIER&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt; or &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<called\_address>: string, which indicates an IPv4 address in the w.x.y.z format. This parameter is not supported currently.

<L2P>: string, which indicates the layer-2 protocol between the TE and MT.

- "PPP": The layer-2 protocol is PPP.
- "1": The layer-2 protocol is PPP.

<cid>: integer, which indicates the index value of the PDP context; **ATD\*99#** is equivalent to **ATD\*99\*\*\*1#**.

1-3

## 7.3 ATD\*98# - Command for Requesting the GPRS IP Service

The **ATD\*98#** command establishes a communication link between the TE and PDN. After the **ITU-T V.250 'D'** (dialing) command is executed, the MT enters the ITU-T V.250 online data state and starts the specified layer-2 protocol jointly with the TE. Other AT commands following this command line are not executed. After the MT enters the online data state, its detailed behaviors depend on the type of PDP.

<b>Execution command</b>	ATD*98[*<cid>]#
<b>Function</b>	Establishes a communication link between the TE and PDN.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;CONNECT&lt;CR&gt;&lt;LF&gt;</li><li>• In case of failed link establishment: &lt;CR&gt;&lt;LF&gt;NO CARRIER&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt; or &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<cid>: integer, which indicates the index value of the PDP context; **ATD\*98#** is equivalent to **ATD\*98\*1#**.

1-3

## 7.4 ATH - Command for Hanging Up the Connection

The **ATH** command hangs up all voice call on the current channel and currently connected data service

<b>Execution command</b>	ATH[<n>]
<b>Function</b>	Hangs up all voice call on the current channel and currently connected data service
<b>Response</b>	<CR><LF>OK<CR><LF>

#### Note:

- The ATH command can deactivate all activated or online PDP contexts. This command cannot be used in the PDP deactivation process that is triggered when the LCP is terminated or the DTR pin is lowered.
- In addition, the ATH command can reject the request for activating the PDP context on the network. The request reports URC"RING: GPRS" or "+CRING: GPRS".

#### Parameter description

<n>: integer; **ATH** is equivalent to **ATH0**.

- 0 (default value): hangs up all CS domain call in activated and waiting state (including voice and CSD data services) and GPRS data services on the current channel.
- 1: hangs up all CS domain call in activated and waiting state (including voice and CSD data services) and GPRS data services on all channels.
- 2: hangs up all CS data services on the current channel.

- 3: hangs up all GPRS data services on the current channel.
- 4: hangs up all activated CS domain call (including voice and CSD data services) on the current channel (the CS data services in waiting state are not hung up).
- 5: hangs up the CS domain call in waiting state (including voice and CSD data services) GPRS data services on the current channel (the CS data services in activated state are not hung up).

## 7.5 ATA - Command for Answering a Call or Data Services

The **ATA** command answers a call or CSD data services

<b>Execution command</b>	ATA
<b>Function</b>	Answers a call or CSD data services.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful in establishing a call: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of successful in establishing CSD data services: &lt;CR&gt;&lt;LF&gt;CONNECT[&lt;text&gt;]&lt;CR&gt;&lt;LF&gt;</li><li>• In case of failed link establishment: &lt;CR&gt;&lt;LF&gt;NO CARRIER&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

- During the command execution process, entering a character interrupts command execution and returns OK.
- The ATA command can be used to receive the PDP context activation request from the network side, and unsolicitedly report URC"RING: GPRS" or "+CRING: GPRS".

## 7.6 ATS0- Commands for Setting the Automatic Answer Data Services

The **ATS0** command sets the automatic answer data service..

### 7.6.1 Reading the Settings of the Automatic Answer Data Services

<b>Read command</b>	ATS0?
<b>Function</b>	Reads the settings of the automatic answering data services.
<b>Response</b>	<CR><LF><n><CR><LF> <CR><LF>OK<CR><LF>

**Parameter description**

<n>: Integer

0: automatic answer mode is disabled.

1~255: number of rings before automatically answering a call.

## 7.6.2 Setting Unsolicitedly Answering Data Services

Write command      **ATS0=<n>**

Function      Sets unsolicitedly answering data services.

Response      

- In case of successful execution: <CR><LF>OK<CR><LF>
- In case of an error: <CR><LF>ERROR<CR><LF>

**Note:**

If <n> is set to a too great value, the calling party may hang up before the call is automatically answered.

## 7.7 ATS7 - Command for Setting the Duration to Be Waited for Completion of Connection Establishment

The **ATS7** command sets the duration to be waited by the TA for the completion of connection establishment when originating or receiving a data call. Generally, this duration is calculated as the duration to be waited for bearer signals. If failing to receive bearer signals within a specified duration, the TA hangs up the current data call.

### 7.7.1 Reading the Set Waiting Duration Request

Read command      **ATS7?**

Function      Reads the set waiting duration.

Response      

- <CR><LF><n><CR><LF>
- <CR><LF>OK<CR><LF>

**Parameter description**

<n>: integer, which indicates the waiting duration in seconds. The default value is **60**.  
000–255

## 7.7.2 Setting the Waiting Duration

<b>Write command</b>	ATS7=<n>
<b>Function</b>	Sets the duration to be waited by the TA for the completion of connection establishment when originating or receiving a data call.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

- This command applies to data call services only.
- <n> is not allowed starting with "0x", or regarding as ATS7=0

## 7.8 AT+CRLP - Command for Setting Radio Link Protocol Parameters for Non-Transparent Transmission Data Services on the Calling Party Side

The **AT+CRLP** command sets the related radio link protocol (RLP) parameters when non-transparent transmission data services are originated.

### 7.8.1 Querying the Supported RLP Parameters

<b>Test command</b>	AT+CRLP=?
<b>Function</b>	Queries the supported RLP parameters.
<b>Response</b>	<CR><LF>+CRLP: (list of supported <iws>s),(list of supported <mws>s), (list of supported <T1>s), (list of supported <N2>s), (list of supported <ver1>s), (list of supported <T4>s)<CR><LF> <CR><LF>OK<CR><LF>

**Parameter description**

<iws>: integer, which indicates the interactive window size (IWF TO MS). The default value is **61**.

0–61

<mws>: integer, which indicates the mobile window size (MS TO IWF). The default value is **61**.

0–61

<T1>: integer, which indicates the acknowledgement timer (T1: measured by 10 ms). The default value is **78** (780 ms).



48–255

<N2>: integer, which indicates the number of times for attempting retransmission. The default value is **6**.

1–255

<ver1>: integer, which indicates the RLP version. Only the value **0** is supported.

<T4>: integer, which indicates the sequence period as an integer. Only the value **7** is supported.

## 7.8.2 Reading RLP Parameters for the Current Non-Transparent Transmission Data Services on the Calling Party Side

<b>Read command</b>	AT+CRLP?
<b>Function</b>	Reads RLP parameters for the current non-transparent transmission data services on the calling party side.
<b>Response</b>	<CR><LF>+CRLP: <iws>,<wms>,<T1>,<N2>,<ver1>,<T4><CR><LF> <CR><LF>OK<CR><LF>

## 7.8.3 Setting RLP Parameters for the Non-Transparent Transmission Data Services on the Calling Party Side

<b>Write command</b>	AT+CRLP=[<iws>[,<mws>[,<T1>[,<N2>]]]]
<b>Function</b>	Sets RLP parameters for the non-transparent transmission data services on the calling party side.
<b>Response</b>	<ul style="list-style-type: none"> <li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li> <li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li> <li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt; +CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li> </ul>

### Note:

If no parameters of this command are set, AT+CRLP= considers the previously set values valid for various parameters.

## 7.9 AT+CBST - Command for Setting the Bearer Service Type

The **AT+CBST** command sets the bearer service <name>, data rate <speed>, and connection mode <ce> that are required for originating data services. The preceding

settings also apply to MT data services, especially in the case that single number data services or the data services originated by similar devices are received.

## 7.9.1 Querying the Supported Bearer Service Types

<b>Test command</b>	AT+CBST=?
<b>Function</b>	Queries the supported bearer service types.
<b>Response</b>	<CR><LF>+CBST: (list of supported <speed>s),(list of supported <name>s), (list of supported <ce>s)<CR><LF> <CR><LF>OK<CR><LF>

### Parameter description

<speed>: integer, which indicates the data rate.

- 0: adaptive baud rate
- 7: 9600 bit/s (V.32) (default value)
- 71: 9600 bit/s (V.110)

<name>: integer

0: asynchronous data circuit (UDI or 3.1kHz modem)

<ce>: integer. The transparent transmission mode is not supported.

1: non-transparent transmission

## 7.9.2 Querying the Current Bearer Service Type

<b>Read command</b>	AT+CBST?
<b>Function</b>	Queries the current bearer service type.
<b>Response</b>	<CR><LF>+CBST: <speed>,<name>,<ce><CR><LF> <CR><LF>OK<CR><LF>

## 7.9.3 Setting the Bearer Service Type

<b>Write command</b>	AT+CBST=<speed>[,<name>[,<ce>]]
<b>Function</b>	Sets the bearer service type.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li></ul>



## 7.10 +++ - Command for Switching Data Mode to Command Mode

The **+++** command switches data mode to command mode during the connection of CSD services or GPRS data services.

**Execution command**      **+++**

**Function**                After “+++” is executed, the TA terminates the data transmission stream on the AT interface and enters the command mode so that AT commands can be executed when the links towards remote terminals or GPRS connections are maintained.

**Response**                <CR><LF>OK<CR><LF>

**Note:**

- To prevent the entered command line from being confused with “+++” in the transmission data stream, do not enter other characters within 1000 ms before and after entering the command line. In addition, two adjacent ‘+’s must be entered at a time interval of smaller than 1000 ms.
- In multiplexing mode, this command is unavailable. In this case, you need to enter other exit instructions (such as DTR signals and modem status command MSC) to switch data mode to command mode.

## 7.11 ATO - Command for Switching Command Mode to Data Mode

The **ATO** command switches command mode to data mode. When a CSD call or GPRS connection is established, the TA is in command mode. This command can switch command mode to data mode or PPP online mode.

**Execution command**      ATO[<n>]

**Function**                Switches command mode to data mode.

**Response**                In case of successful execution: <CR><LF>CONNECT <CR><LF>  
In case of failed connection recovery: <CR><LF>NO  
CARRIER<CR><LF>

**Parameter description**

<n>: integer; **ATO** is equivalent to **ATO0**.

0 (default value): switches command mode to data mode.



## 7.12 AT+CHUP - Command for Hanging Up Data Services

The **AT+CHUP** command hangs up all active and suspended call (including voice and CSD data service).

### 7.12.1 Checking Whether AT+CHUP Hang-up Is Supported

Test command	AT+CHUP=?
Function	Checks whether AT+CHUP hang-up is supported.
Response	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt; +CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### 7.12.2 AT+CHUP Command for Hanging Up

Execution command	AT+CHUP
Function	Hangs up all active and suspended data services. (including voice and CSD data service)
Response	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt; +CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

## 7.13 AT+CR - Command for Setting the Service Reporting Mode

The **AT+CR** command sets whether to report the intermediate result code **+CR: <ser>** to the TE during the establishment of data services.

## 7.13.1 Querying the Supported Settings for Service Reporting

- Test command** AT+CR=?
- Function** Queries the supported settings for service reporting.
- Response**
- In case of successful execution:  
<CR><LF>+CR: (list of supported <mode>s) <CR><LF>  
<CR><LF>OK<CR><LF>
  - In case of an error: <CR><LF>ERROR<CR><LF>

### Parameter description

<mode>: integer.

- 0 (default value): disables service reporting.
- 1: enables service reporting. The TA reports the intermediate result code after determining the rate and service quality in connection negotiation and before reporting error settings or data compression and other result codes such as CONNECT.

+CR: <serv>

<serv>: string. Table 7-1 describes the values of <serv>.

**Table 7-1** Values of <serv>

Value	Description
"REL ASYNC"	Asynchronous and non-transparent transmission
"GPRS"	Request for activating the PDP context on the GPRS network

## 7.13.2 Reading the Current Settings for Service Reporting

- Read command** AT+CR?
- Function** Reads the current settings for service reporting.
- Response**
- In case of successful execution:  
<CR><LF>+CR: <mode><CR><LF>  
<CR><LF>OK<CR><LF>
  - In case of an error: <CR><LF>ERROR<CR><LF>

### 7.13.3 Setting Service Reporting

**Write command** AT+CR=[<mode>]

**Function** Sets service reporting.

**Response**

- In case of successful execution: <CR><LF>OK<CR><LF>
- In case of an error: <CR><LF>ERROR<CR><LF>

**Note:**

If no parameters of this command are set, AT+CR= considers the previously set values valid for various parameters.

## 7.14 AT+CRC - Command for Setting the Cell Result Codes

The **AT+CRC** command sets whether the caller ID display follows the extended format.

### 7.14.1 Querying the Supported Settings for the Cell Result Codes

**Test command** AT+CRC=?

**Function** Queries the settings for the cell result code in caller ID display.

**Response**

- In case of successful execution:  
<CR><LF>+CR: (list of supported <mode>s) <CR><LF>  
<CR><LF>OK<CR><LF>
- In case of an error: <CR><LF>ERROR<CR><LF>

**Parameter description**

<mode>: integer.

- 0 (default value): does not follow the extended format. In this case, the reporting format is RING.
- 1: follows the extended format. In this case, the reporting format is as follows:

+CRING: <type>

<type>: string. Table 7-2 describes the values of <type>.

**Table 7-2** Values of <type>

Value	Description
"REL ASYNC"	Asynchronous and non-transparent transmission

Value	Description
"GPRS"	Request for activating the PDP context on the GPRS network
"VOICE"	Voice call

## 7.14.2 Querying the Current Settings for the Cell Result Codes

<b>Read command</b>	AT+CRC?
<b>Function</b>	Reads the current settings for the cell result code in caller ID display.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CRC: &lt;mode&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li></ul>

## 7.14.3 Settings the Cell Result Codes

<b>Write command</b>	AT+CRC=[<mode>]
<b>Function</b>	Sets the cell result code in caller ID display.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

If no parameters of this command are set, **AT+CRC=** considers the previously set values valid for various parameters.

## 7.15 AT+VTS - Command for Sending the DTMF Tone

The **AT+VTS** command sends the DTMF tone.

## 7.15.1 Sending the DTMF Tone

<b>Write command</b>	AT+VTS=<DTMF>
<b>Function</b>	Sends the DTMF tone.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<DTMF>: character type; 0–9, #, \*, A, B, C, D in the ASCII character set.

## 7.16 AT+CLIP - Command for Displaying the Calling Line Identification

The **AT+CLIP** command refers to the Calling Line Identification Presentation (CLIP), a GSM supplementary service. The called party can get the Calling Line Identification (CLI) of the caller when receiving a call.

### 7.16.1 Querying the Settings Supported by the AT+CLIP Command

<b>Test Command</b>	AT+CLIP=?
<b>Function</b>	Queries the CLIP settings that can be set by the command.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CLIP: (list of supported &lt;n&gt;s)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<n>: integer; sets or displays the result code state of TE (the value set for <n> remains unchanged even if the module is powered off).

- 0 (default value): indicates that the CLIP is not provisioned.
- 1: indicates that the CLIP is provisioned.



## 7.16.2 Reading the Settings of the CLIP Service

<b>Read command</b>	AT+CLIP?
<b>Function</b>	Reads the settings of the CLIP service.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CLIP:&lt;n&gt;,&lt;m&gt;&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<m>: integer; sets whether the CLIP service is provisioned on the network.

- 0: indicates that the CLIP is not provisioned.
- 1: indicates that the CLIP is provisioned.
- 2: unknown (due to interworking problems or limitations of originating network).

## 7.16.3 Setting the CLIP

<b>Write command</b>	AT+CLIP=[<n>]
<b>Function</b>	Enables or disables the CLIP service.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt; +CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Note:

AT+CLIP= is equivalent to AT+CLIP=0.

## 7.16.4 +CLIP - Command for Unsolicitedly Reporting the CLI

URC	<CR><LF>+CLIP:<number>,<type>[,<subaddr>,<satype>[,<alpha>]][,<CLI validity>]]<CR><LF>
-----	--

### Parameter description

<number>: character type, which indicates the telephone number.

<type>: integer type, which indicates the telephone number in character type.

- 145: international number
- 129: other number

<subaddr>: string type subaddress of format specified by <satype>

<satype>: type of subaddress octet in integer format

<alpha>: string type, not supported currently

<CLI validity>: integer type

- 0: The CLI is valid.
- 1: The CLI is withheld by the caller.
- 2: The CLI is not available due to interworking problems or limitations of originating network

## 7.17 RING – Command for Unsolicitedly Reporting Incoming Calls

This command indicates that the module has an incoming call.

If **AT+CRRC** is set to **0**, this command is reported in the case of an incoming call.

URC                    <CR><LF>RING<CR><LF>

## 7.18 +CRING – Command for Unsolicitedly Reporting Incoming Calls

This command indicates that the module has an incoming call.

If **AT+CRRC** is set to **1**, this command is reported in the case of an incoming call.

URC                    <CR><LF>+CRING: <type><CR><LF>

### Parameter description

<type>: character string. Table 7-3 lists the values.

**Table 7-3** <type> values

Value	Description
"REL ASYNC"	Asynchronous non-transparent transmission
"GPRS"	PDP context activation request at the GPRS network side
"VOICE"	Voice call

# 8

## Commands for Network Services

---

This chapter describes the AT commands that allow users to query and configure the operator information.

### 8.1 AT+COPN - Command for Querying the Operator Name

The **AT+COPN** command queries the operator name.

#### 8.1.1 Checking Whether This Command Is Supported

<b>Test command</b>	AT+COPN=?
<b>Function</b>	Checks whether this command is supported.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of available command: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of unavailable command: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

## 8.1.2 Reading the List of Operators

**Execution command** AT+COPN

**Function** Reads the list of operators.

**Response**

- In case of successful execution:  
<CR><LF>+COPN:<numericn>,<alphan><CR><LF>  
[<CR><LF>+COPN: ...(list of operators)<CR><LF>]  
<CR><LF>OK<CR><LF>
- In case of an error during command execution:  
<CR><LF>ERROR<CR><LF>
- In case of an error related to the MT during command execution:  
<CR><LF>+CME ERROR: <err><CR><LF>

### Parameter description

<numericn>: indicates an operator in numeric format.

<alphan>: indicates an operator in long string format.

## 8.1.3 Examples

Example 1:

Query the command status.

AT+COPN=?

OK

The command is available.

Example 2:

Query all the operator information.

AT+COPN

+COPN: "36320", "DIGICEL"

<list of operator information, which is omitted due to excessive length>

OK

## 8.2 AT+COPS - Command for Selecting Operators

The **AT+COPS** command registers a network and queries the currently registered network status and network selection mode.

## 8.2.1 Checking the Current Available Network and Operator Information

**Test command** AT+COPS=?

**Function** Returns the current available network and operator information.

**Response**

- In case of successful execution:  
<CR><LF>+COPS: [list of present operators(<opStatus>,long alphanumeric <oper>,short alphanumeric <oper>,numeric <oper>)],,(list of supported <mode>),(list of supported <format>)<CR><LF>  
<CR><LF>OK<CR><LF>
- In case of an error during command execution:  
<CR><LF>ERROR<CR><LF>
- In case of an error related to the MT during command execution:  
<CR><LF>+CME ERROR: <err><CR><LF>

**Note:**

It takes a long time for this command to query the current available network.

### Parameter description

<mode>: network selection mode, whose values are as follows:

- 0 (default value): automatic mode (other parameters are omitted)
- 1: manual network searching

2: deregisters a network and maintains the network in unregistered state until **<mode>=0, 1, or 4** (This is not supported currently).

- 3: sets the value of **<format>** in the result returned by the **READ** command
- 4: combination of automatic and manual network searching modes. If manual network searching fails, the automatic network searching mode is started.

< opStatus >: network status identifier, whose values are as follows:

- 0: unknown
- 1: available
- 2: currently registered
- 3: disabled

<format>: format of the operator information **<oper>**. The values of this parameter are as follows:

- 0 (default value): operator information **<oper>** in long string format, which consists of not more than 16 characters.
- 2: operator information **<oper>** in numeric format.

<oper>: operator information. In a test command, the operator name follows the long string format and numeric format. In a read command, the operator name contains all fields.

## 8.2.2 Reading the Currently Registered Network and Operator Information

<b>Read command</b>	AT+COPS?
<b>Function</b>	Reads the currently registered network and operator information.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+COPS: &lt;mode&gt;[,&lt;format&gt;[,&lt;oper&gt;]]&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

## 8.2.3 Setting the Current Operator Information

<b>Write command</b>	AT+COPS=<mode>[,<format>[,<oper>]]
<b>Function</b>	Sets the current operator information.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

- In automatic network searching mode, only the <mode> parameter is valid and other parameters are omitted.
- When the set operator information does not exist or is unavailable, the CME ERROR is returned.

## 8.2.4 Examples

Example 1:

Obtain the list of available operator information.

AT+COPS=?

+COPS: (2,"CC 460 NC 09",,"46009"),(3,"CHN-CUGSM",,"46001"),(3,"CHINA MOBILE",,"46000"),,(0-4),(0,2)

OK

Example 2:

Set the automatic network searching mode.

AT+COPS=0  
only the **<mode>** parameter is valid.

In automatic network searching mode,

OK

Example 3:

Manually register with the network.

AT+COPS=1,2,46000

OK

## 8.3 AT+CREG - Command for Querying Network Registration

The **AT+CREG** command queries network registration.

### 8.3.1 Checking the Parameter Range Supported by This Command

Test command	AT+CREG=?
Function	Returns the parameter range supported by this command.
Response	<ul style="list-style-type: none"> <li>In case of successful execution:  &lt;CR&gt;&lt;LF&gt;+CREG: (list of supported &lt;n&gt;s)&lt;CR&gt;&lt;LF&gt;  &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li> <li>In case of an error during command execution:  &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li> <li>In case of an error related to the MT during command execution:  &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li> </ul>

#### Parameter description

<n>: URC mode

- 0 (default value): disables unsolicited reporting of **AT+CREG**.
- 1: enables unsolicited reporting of **+CREG: <stat>**. When **<n>=1**, that is, when the status of network registration changes, **+CREG: <stat>** is reported.
- 2: enables unsolicited reporting of **+CREG: <stat>[,<lac>,<ci>]**. After the **AT+CREG READ** command is sent previously or is reported unsolicitedly, the values of the **<lac>** and **<ci>** parameters do not change, the preceding command is not displayed. During the call, the optional parameters **<lac>** and **<ci>** are not displayed. When **<n>=2**, that is, when the cell information changes, **+CREG: <stat>[,<lac>,<ci>]** is reported. The location information **<lac>,<ci>** is reported only when **<n>=2**.



## 8.3.2 Querying the Current Status of Network Registration

**Read command** AT+CREG?

**Function** Queries the current status of network registration.

**Response**

- In case of successful execution:  
<CR><LF>+CREG:<n>,<stat>[,<lac>,<ci>]<CR><LF>  
<CR><LF>OK<CR><LF>
- In case of an error during command execution:  
<CR><LF>ERROR<CR><LF>
- In case of an error related to the MT during command execution:  
<CR><LF>+CME ERROR: <err><CR><LF>

### Parameter description

<stat>: current status of network registration.

- 0: does not register. Currently, the ME does not search for a new operator to be registered with.
- 1: registers with the local network.
- 2: does not register. The ME, however, is searching for a new operator to be registered with.
- 3: Network registration is rejected.
- 4: unknown reason.
- 5: registers with the roaming network.

<lac>: location area code, which consists of two bytes in hexadecimal mode (for example, "00C3" = 195 in decimal mode).

<ci>: cell information, which consists of two bytes in hexadecimal mode.

## 8.3.3 Setting the Status of Network Registration

**Write command** AT+CREG=[<n>]

**Function** Queries the current status of network registration.

**Response**

- In case of successful execution: <CR><LF>OK<CR><LF>
- In case of an error during command execution:  
<CR><LF>ERROR<CR><LF>
- In case of an error related to the MT during command execution:  
<CR><LF>+CME ERROR: <err><CR><LF>

### Note:

In this section, AT+CREG= is equivalent to AT+CREG=0.







## 8.4.1 Checking the Parameter Range Supported by This Command

**Test command** AT+CSQ=?

**Function** Returns the parameter range supported by this command.

**Response**

- In case of successful execution:  
<CR><LF>+CSQ: (list of supported <rsi>s),(list of supported <ber>s)<CR><LF>  
<CR><LF>OK<CR><LF>
- In case of an error during command execution:  
<CR><LF>ERROR<CR><LF>
- In case of an error related to the MT during command execution:  
<CR><LF>+CME ERROR: <err><CR><LF>

### Parameter description

<rsi>: receive signal strength indicator

- 0:  $\leq -113$  dBm
- 1: -111 dBm
- 2...30: -109...-53 dBm
- 31:  $\geq -51$  dBm
- 99: unknown or immeasurable

<ber>: bit error rate in percentage. The value of **ber** can be queried only during the call processing. Otherwise, only the value **0** or **99** is returned. Currently, only the value **99** is returned.

- 0–7: correspond to the values of **RXQUAL** in the GSM 05.08 section 8.2.4.
- 99: unknown or immeasurable



## 8.4.2 Querying the Current Signal Quality

<b>Execution command</b>	AT+CSQ
<b>Function</b>	Queries the current signal quality.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CSQ: &lt;rsqi&gt;,&lt;ber&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

After running a network related AT command such as AT+CLCK, you are advised to run the AT+CSQ command after three seconds.

## 8.4.3 Examples

Example 1:

Query the parameter range supported by the command.

AT+CSQ=?

+CSQ: (0-31,99),(0-7,99)

OK

Example 2:

Query the current signal quality.

AT+CSQ

+CSQ: 23, 99

OK

## 8.5 AT^SMONC - Command for Querying the Cell Information

The **AT^SMONC** command obtains the cell information. A maximum of seven BTS cells can be obtained, including the serving cell and up to six neighbor cells.

## 8.5.1 Checking Whether This Command Is Available

<b>Test command</b>	AT^SMONC=?
<b>Function</b>	Checks whether this command is available.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of available command: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of unavailable command: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

## 8.5.2 Querying the Cell Information

<b>Execution command</b>	AT^SMONC
<b>Function</b>	Obtains the cell information.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;^SMONC: &lt;MCC&gt;1,&lt;MNC&gt;1,&lt;LAC&gt;1,&lt;cell&gt;1,&lt;BSIC&gt;1,&lt;chann&gt;1,&lt;RSSI&gt;1,&lt;C1&gt;1,&lt;C2&gt;1,&lt;MCC&gt;2,&lt;MNC&gt;2,&lt;LAC&gt;2,&lt;cell&gt;2,&lt;BSIC&gt;2,&lt;chann&gt;2,&lt;RSSI&gt;2,&lt;C1&gt;2, &lt;C2&gt;2, ...&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<MCC>: country code, which is a 3-digit decimal number.

<MNC>: network code, which is a 2- or 3-digit decimal number.

<LAC>: location area code, which is a 4-digit hexadecimal number.

<cell>: cell code, which is a 4-digit hexadecimal number.

<BSIC>: base station identification code, which is a 2-digit decimal number.

<chann>: Absolute Frequency Channel Number (ARFCN)

<RSSI>: received signal level of BCCH carriers (0–63), which is expressed by dBm value plus offset value. For details, see the 3GPP TS 05.08.

<C1>: cell reselection coefficient.

<C2>: cell reselection coefficient.



## 8.5.3 Examples

Example 1:

Query the parameter range supported by the command.

AT^SMONC=?

OK

Example 2:

Query the current cell information.

AT^SMONC

^SMONC:

460,01,2540,7ade,3b,722,19,23,33,460,01,2540,7a9a,03,730,18,20,30,460,01,2540,  
7a09,32,118,16,19,19,000,000,0000,0000,00,0,0,-,-,000,000,0000,0000,00,0,0,-,-  
,000,000,0000,0000,00,0,0,-,-,000,000,0000,0000,00,0,0,-,-

OK

## 8.6 AT^SMOND - Command for Querying the Cell Information (Including Neighbor Cells)

The **AT^SMOND** command obtains the information about the serving cell and up to six related neighbor cells. This command can obtain the detailed information about the receive signal strength.

### 8.6.1 Checking Whether This Command Is Available

<b>Test command</b>	AT^SMOND=?
<b>Function</b>	Checks whether this command is available.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

## 8.6.2 Querying the Cell Information

**Execution command** AT^SMOND

**Function** Obtains the cell information.

**Response**

- In case of successful execution:  
<CR><LF>^SMOND: [<sci>][,<nci>][,<TA>][,<rssiber>]<CR><LF>  
<CR><LF>OK<CR><LF>
- In case of an error during command execution:  
<CR><LF>ERROR<CR><LF>
- In case of an error related to the MT during command execution:  
<CR><LF>+CME ERROR: <err><CR><LF>

### Parameter description

<sci>: serving cell information (separated by a comma, excluding CR/LF), which is described as follows:

<MCC>,<MNC>,<LAC>,<cell>,<BSIC>,<chann>,<RxLev>,<RxLevFull>,<RxLev Sub>,<RxQual><RxQual Full>,<RxQual Sub>,<Timeslot>

If the serving cell information is not found, the parameter values are omitted. For example, “,,,,,<RxLev>,,0,,0”

<nci>: neighbor cell information (neighbor cells 1–6) (separated by a comma, excluding CR/LF), which is described as follows:

<MCC>1,<MNC>1,<LAC>1,<cell>1,<BSIC>1,<chann>1,<RxLev>1, (these parameters repeated for neighbor cells 2 through 6 with no CR/LF): ...  
<MCC>6,<MNC>6,<LAC>6,<cell>6,<BSIC>6,<chann>6,<RxLev>6; for unavailable cells, “,,,,,0” is displayed.

<TA>: timing advance value of the serving cell (bits)

<rssiber>: RSSI and BER values (separated by a comma, excluding CR/LF), which are described as follows:

<RSSI>,<BER>

<MNC>: network code, which is a 2- or 3-digit decimal number.

<LAC>: location area code, which is a 4-digit hexadecimal number.

<cell>: cell code, which is a 4-digit hexadecimal number.

<BSIC>: base station identification code, which is a 2-digit decimal number.

<chann>: Absolute Frequency Channel Number (ARFCN)

<RxLev>: receive signal level (dBm)

<RsQual>: receive signal quality, which is defined in the GSM05.08.

<Timeslot>: assigned time slots (0–8). If the MS is in idle mode, time slot 0 is displayed.

<RSSI>: receive signal strength indicator (0–31).

<BER>: bit error rate (0–7, 99)

### 8.6.3 Examples

Example 1:

Query the current cell information.

AT^SMOND

^SMOND: 460, 09,0001,0003,00, 552,  
47,,,0,,,0,,,,,0,,,,,0,,,,,0,,,,,0,,,,,0,,,,,0,255,47,255

OK

## 8.7 AT^MONI - Command for Querying the Cell Information in Idle and Dedicated Modes

The **AT^MONI** command obtains the information about the serving cell or dedicated cells. In idle and dedicated modes of the ME, the cell information (serving cell information and dedicated channel information) can be returned by execution command and write command. The write command periodically returns the cell information. To stop periodical return of the cell information, you can enter any character.

### 8.7.1 Checking the Parameter Range Supported by This Command

<b>Test command</b>	AT^MONI=?
<b>Function</b>	Returns the parameter range supported by this command.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;^MONI: (list of supported &lt;period&gt;s)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<period>: integer parameter, which indicates the period in seconds. Value range: 1–254.

**Table 8-1** List of parameters for the serving cell

Parameter	Description
chann	ARFCN (Absolute Frequency Channel Number) of the BCCH carrier
rs	RSSI value (0–63) (RSSI= Received signal strength indication)
dBm	Receive signal strength of the BCCH (dBm)
MCC	Country code (first part of the PLMN code)
MNC	Network code (second part of the PLMN code)
LAC	Location area code
cell	Cell ID
NCC	Network color code, which is used to differentiate PLMN subnets
BCC	Base station color code, which is used to differentiate intra-frequency cells
PWR	Maximum power level of the RACH (dBm)
PXLev	Minimum receive signal level allowed for registration (dBm)
C1	Base station selection coefficient

**Table 8-2** List of parameters for dedicated channels

Parameter	Description
chann	Absolute Frequency Channel Number (ARFCN) of the Traffic Channel (TCH) <b>Note:</b> When <chann>=h, it indicates frequency hopping.
TS	Sequence number of time slot
dBm	Receive signal strength level of the BCCH (dBm)
timAdv	Timing advance value (bits)
PWR	Power level
dBm	Receive signal strength level of the TCH (dBm)
Q	Receive signal quality (0–7)
ChMod	Channel mode (–: Signaling, S_HR: Half rate, S_FR: Full rate, S_EFR: Enhanced Full Rate, A_HR: AMR Half rate, A_FR: AMR Full rate)

Parameter values set for the ME in different states





The ME has accessed the cell and registered with the network.

Serving cell												I Dedicated channel
Chann	rs	dBm	MCC	MNC	LAC	cell	NCC	BCC	PWR	RXLev	C1	I chann TS timAdv PWR dBm Q ChMod
82	23	-63	460	00	0001	0003	0	0	0	-102	13	I No connection

The ME has accessed the cell but has not registered with the network (only emergency calls can be made).

Serving cell												I Dedicated channel
Chann	rs	dBm	MCC	MNC	LAC	cell	NCC	BCC	PWR	RXLev	C1	I chann TS timAdv PWR dBm Q ChMod
82	23	-63	460	00	0001	0003	0	0	0	-102	13	Limited Service

The ME is searching for the network but fails to find a proper cell.

Serving cell												I Dedicated channel
Chann	rs	dBm	MCC	MNC	LAC	cell	NCC	BCC	PWR	RXLev	C1	I chann TS timAdv PWR dBm Q ChMod
Searching												

The returned result contains the related text information based on the service status.

Value	Description
Searching	The MS is searching for the network but fails to find a proper cell. When the MS restarts or is not covered by signals, the MS is in this service state.
No connection	The MS is accessing the cell and registering with the network. In this case, the service state is "idle".
Cell Reselection	The MS is covered by signals of a cell but is searching for a better cell.
Limited Service	The MS is located inside a cell but does not register with the network. In this case, the MS can make emergency calls only.

## 8.7.2 Obtaining the Information About the Serving Cell or Dedicated Cells.

**Execution command** AT^MONI

**Function** Obtains the information about the serving cell or dedicated cells.

**Response**

- In case of successful execution:  
<CR><LF>Serving cell  
I Dedicated channel  
  
<CR><LF>chann rs dBm MCC MNC LAC cell NCC BCC PWR RXLev  
C1 I chann TS timAdv PWR dBm Q ChMod  
<CR><LF>.....(list of cell information, For details, see Examples.)  
<CR><LF><CR><LF>OK<CR><LF>
- In case of an error during command execution:  
<CR><LF>ERROR<CR><LF>
- In case of an error related to the MT during command execution:  
<CR><LF>+CME ERROR: <err><CR><LF>

**Note:**

"Limited service" or "Searching" may be returned only when the module is unsolicitedly searching for or deregistering with the network.

## 8.7.3 Periodically Obtaining the Information About the Serving Cell or Dedicated Cells.

**Write command** AT^MONI=<period>

**Function** Periodically obtains the information about the serving cell or dedicated cells.

**Response**

- In case of successful execution:  
Periodically returns <CR><LF>Serving cell  
I Dedicated channel  
  
<CR><LF>chann rs dBm MCC MNC LAC cell NCC BCC PWR RXLev  
C1 I chann TS timAdv PWR dBm Q ChMod  
<CR><LF>..... (list of cell information. For details, see Examples.)  
<CR><LF>..... (list of cell information. For details, see Examples.)  
<CR><LF>..... (list of cell information. For details, see Examples.)  
<CR><LF>..... (list of cell information. For details, see Examples.)  
<CR><LF>..... (list of cell information. For details, see Examples.)  
<CR><LF>..... (list of cell information. For details, see Examples.)  
<CR><LF>.....(list of cell information. For details, see Examples.)

```
<CR><LF>.....(list of cell information. For details, see Examples.)
<CR><LF>.....(list of cell information,. For details, see Examples.)
<CR><LF>.....(list of cell information,. For details, see Examples.)
<CR><LF>...(enter any character to stop periodical return of the list of
cell information)
(For details, see Examples.)
<CR><LF><CR><LF>OK<CR><LF>
```

- In case of an error during command execution:  
<CR><LF>ERROR<CR><LF>
- In case of an error related to the MT during command execution:  
<CR><LF>+CME ERROR: <err><CR><LF>

**Note:**

"Limited service" or "Searching" may be returned only when the module is unsolicitedly searching for or deregistering with the network.

## 8.7.4 Examples

Example 1:

Query the parameter range supported by the command.

AT^MONI=?

^MONI: (1-254)

OK

Example 2:

Query the cell information.

AT^MONI

Serving cell

I Dedicated channel

chann	rs	dBm	MCC	MNC	LAC	cell	NCC	BCC	PWR	RXLev	C1	I	chann	TS	timAdv	
PWR	dBm	Q	ChMod													
552	18	-76	460	09	0001	0003	0	0	0	-102	32	I	No			

connection

OK

Example 3:

Periodically return the cell information.

AT^MONI=1

Serving cell

I Dedicated channel



chann	rs	dBm	MCC	MNC	LAC	cell	NCC	BCC	PWR	RXLev	C1	I	chann	TS	timAdv
PWR	dBm	Q	ChMod												

552	18	-69	460	09	0001	0003	0	0	0	-102	32	I	No	connection	
552	18	-69	460	09	0001	0003	0	0	0	-102	32	I	No	connection	
552	18	-69	460	09	0001	0003	0	0	0	-102	32	I	No	connection	
552	18	-69	460	09	0001	0003	0	0	0	-102	32	I	No	connection	
552	18	-69	460	09	0001	0003	0	0	0	-102	32	I	No	connection	
552	18	-69	460	09	0001	0003	0	0	0	-102	32	I	No	connection	
552	18	-69	460	09	0001	0003	0	0	0	-102	32	I	No	connection	
552	18	-69	460	09	0001	0003	0	0	0	-102	32	I	No	connection	
552	18	-69	460	09	0001	0003	0	0	0	-102	32	I	No	connection	
552	18	-69	460	09	0001	0003	0	0	0	-102	32	I	No	connection	

Serving cell

I Dedicated channel

chann	rs	dBm	MCC	MNC	LAC	cell	NCC	BCC	PWR	RXLev	C1	I	chann	TS	timAdv
PWR	dBm	Q	ChMod												

552	18	-69	460	09	0001	0003	0	0	0	-102	32	I	No	connection	
552	18	-70	460	09	0001	0003	0	0	0	-102	32	I	No	connection	
552	18	-70	460	09	0001	0003	0	0	0	-102	32	I	No	connection	
552	18	-70	460	09	0001	0003	0	0	0	-102	32	I	No	connection	
552	18	-70	460	09	0001	0003	0	0	0	-102	32	I	No	connection	
552	18	-70	460	09	0001	0003	0	0	0	-102	32	I	No	connection	
552	18	-70	460	09	0001	0003	0	0	0	-102	32	I	No	connection	
552	18	-70	460	09	0001	0003	0	0	0	-102	32	I	No	connection	
552	18	-70	460	09	0001	0003	0	0	0	-102	32	I	No	connection	
552	18	-70	460	09	0001	0003	0	0	0	-102	32	I	No	connection	

e  
OK

## 8.8 AT^MONP - Command for Monitoring Idle Neighbor Cells

The **AT^MONP** command monitors neighbor cells and obtains the information about a maximum of six neighbor cells through the execution command and write command. The write command periodically returns the related information. To stop periodical return of the related information, you can enter any character.



## 8.8.1 Checking the Parameter Range Supported by This Command

Test command	AT^MONP=?
Function	Returns the parameter range supported by this command.
Response	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;^MONP: (list of supported &lt;period&gt;s)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<period>: integer parameter, which indicates the period in seconds. Value range: 1–254.

For details about other parameters, see the **AT^SMONC** command.

## 8.8.2 Obtaining the Monitoring Information About Neighbor Cells

**Execution command** AT^MONP

**Function** Obtains the monitoring information about neighbor cells.

**Response**

- In case of successful execution:  
    <CR><LF>chann rs dBm MCC MNC BCC C1 C2  
    [<CR><LF>..... (information about neighbor cells. For details, see Examples.)  
    [<CR><LF>..... (information about neighbor cells. For details, see Examples.)  
    [<CR><LF>..... (information about neighbor cells. For details, see Examples.)  
    [<CR><LF>..... (information about neighbor cells. For details, see Examples.)  
    [<CR><LF>..... (information about neighbor cells. For details, see Examples.)  
    [<CR><LF>..... (information about neighbor cells. For details, see Examples.)]]]]]  
    <CR><LF><CR><LF>OK<CR><LF>
- In case of an error during command execution:  
    <CR><LF>ERROR<CR><LF>
- In case of an error related to the MT during command execution:  
    <CR><LF>+CME ERROR: <err><CR><LF>

### 8.8.3 Periodically Obtaining the Monitoring Information About Neighbor Cells

**Write**       $AT^{MONP} = \langle n \rangle$   
**command**

**Function** Periodically obtains the monitoring information about neighbor cells.

**Response**

- In case of a successful execution:
 

Periodically returns <CR><LF>chann rs dBm MCC MNC BCC C1 C2

<CR><LF>.....(information about neighbor cells, For details, see Examples.)

<CR><LF>.....(information about neighbor cells, For details, see Examples.)

<CR><LF>.....(information about neighbor cells, For details, see Examples.)

<CR><LF>.....(information about neighbor cells, For details, see Examples.)

<CR><LF>.....(information about neighbor cells, For details, see Examples.)

<CR><LF>.....(information about neighbor cells, For details, see Examples.)

<CR><LF>.....(information about neighbor cells, For details, see Examples.)

<CR><LF>.....(information about neighbor cells, For details, see Examples.)

<CR><LF>.....(information about neighbor cells, For details, see Examples.)<CR><LF>...(enter any character to stop periodical return of the list of cell information)

<CR><LF>OK<CR><LF>
- In case of an error during command execution:
 

<CR><LF>ERROR<CR><LF>
- In case of an error related to the MT during command execution:
 

<CR><LF>+CME ERROR: <err><CR><LF>

### 8.8.4 Examples

Example 1:

Query the parameter range supported by the command.

AT^MONP=?

^MONP: (1-254)



OK

Example 2:

Query the information about neighbor cells.

AT^MONP

chann	rs	dBm	MCC	MNC	BCC	C1	C2
712	20	-73	460	001	2	22	32
735	16	-81	460	001	7	19	27
705	15	-83	460	001	5	12	22

OK

Example 3:

Periodically return the information about neighbor cells.

AT^MONP=1

chann	rs	dBm	MCC	MNC	BCC	C1	C2
712	20	-73	460	001	2	22	32
735	16	-81	460	001	7	19	27
705	15	-83	460	001	5	12	22
712	20	-73	460	001	2	22	32
735	16	-81	460	001	7	19	27
705	15	-83	460	001	5	12	22
712	20	-73	460	001	2	22	32
735	16	-81	460	001	7	19	27
705	15	-83	460	001	5	12	22
712	20	-73	460	001	2	22	32

chann	rs	dBm	MCC	MNC	BCC	C1	C2
712	20	-73	460	001	2	22	32
735	16	-81	460	001	7	19	27
705	15	-83	460	001	5	12	22
712	20	-73	460	001	2	22	32
735	16	-81	460	001	7	19	27
705	15	-83	460	001	5	12	22
712	20	-73	460	001	2	22	32
735	16	-81	460	001	7	19	27
705	15	-83	460	001	5	12	22



712 20 -73 460 001 2 22 32  
e  
OK

## 8.9 AT^SMONG - Command for GPRS Monitoring

The **AT^SMONG** command performs GPRS monitoring and obtains the information about the cells that support the GPRS function. The information can be obtained by execution command and write command. The write command can be set to periodically return the cell information. To stop periodical return of the cell information, you can enter any character.

### 8.9.1 Checking the Parameter Range Supported by This Command

<b>Test command</b>	AT^SMONG=?
<b>Function</b>	Returns the parameter range supported by this command.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;^SMONG: (list of supported &lt;table&gt;s),(list of supported &lt;period&gt;s)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<period>: integer parameter. This parameter can be set to periodically return the list of cell information (in seconds).

Value range: 1–100. If the value of the <period> parameter is omitted, the returned cell information is displayed in a single line. If the value of the <period> parameter is set, 10 lines of cell information are returned periodically and each 10 lines are accompanied by a text title line.

<table>: integer, which indicates the cell information table. The value is 1.

**Table 8-3** List of cell information

Parameter	Description
BCCH	Absolute Frequency Channel Number (ARFCN) of the Broadcast Control Channel (BCCH)



Parameter	Description
G	GPRS status of the current serving cell: -: unavailable 1: available
PBCCH	If Packet Broadcast Control Channel (PBCCH) exists, this parameter indicates the ARFCN. Otherwise, this parameter is left empty or set to <b>H</b> (frequency hopping).
PAT	Priority Access Threshold (GSM Rec. 04.08 / 10.5.2.37b) 0: The current cell forbids packet access. 1: reserved; equivalent to "000" (forbids packet access) 2: reserved; equivalent to "000" (forbids packet access) 3: allows packet access; the priority is 1. 4: allows packet access; the priority is 1–2. 5: allows packet access; the priority is 1–3. 6: allows packet access; the priority is 1–4.
MCC	Mobile Country Code
MNC	Mobile Network Code
NOM	Network Operation Mode (0...2)
TA	Timing Advance Value
RAC	Routing Area Code (in hexadecimal mode)



## 8.9.2 Obtaining the Information About the Cells That Support the GPRS Function

**Execution command** AT^SMONG

**Function** Obtains the list of cell information.

**Response**

- In case of successful execution:  
<CR><LF>GPRS Monitor<CR><LF>  
<CR><LF>BCCH G PBCCH PAT MCC MNC NOM TA  
RAC # cell #  
<CR><LF>.....(list of cell information, For details, see  
Examples.)<CR><LF>  
<CR><LF><CR><LF><CR><LF><CR><LF><CR><LF><CR><LF>  
<CR><LF>OK<CR><LF>
- In case of an error during command execution:  
<CR><LF>ERROR<CR><LF>
- In case of an error related to the MT during command execution:  
<CR><LF>+CME ERROR: <err><CR><LF>

**Note:**

"Limited service" or "Searching" may be returned only when the module is unsolicitedly searching for or deregistering with the network.

## 8.9.3 Obtaining the Information About the Cells That Support the GPRS Function

<b>Write command</b>	AT^SMONG=<table>[,<period>]
<b>Function</b>	Obtains the list of information about the cells that support the GPRS function.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: If the <b>&lt;period&gt;</b> parameter is not set, the response is the same as that returned for the execution command in the preceding section. If the <b>&lt;period&gt;</b> parameter is set: &lt;CR&gt;&lt;LF&gt;GPRS Monitor&lt;CR&gt;&lt;LF&gt; Periodically returns &lt;CR&gt;&lt;LF&gt;BCCH G PBCCH PAT MCC MNC NOM TA RAC # cell # &lt;CR&gt;&lt;LF&gt;..... (list of cell information. For details, see Examples.) &lt;CR&gt;&lt;LF&gt;..... (list of cell information. For details, see Examples.) &lt;CR&gt;&lt;LF&gt;..... (list of cell information. For details, see Examples.) &lt;CR&gt;&lt;LF&gt;..... (list of cell information. For details, see Examples.) &lt;CR&gt;&lt;LF&gt;..... (list of cell information. For details, see Examples.) &lt;CR&gt;&lt;LF&gt;..... (list of cell information. For details, see Examples.) &lt;CR&gt;&lt;LF&gt;..... (list of cell information. For details, see Examples.) &lt;CR&gt;&lt;LF&gt;..... (list of cell information. For details, see Examples.) &lt;CR&gt;&lt;LF&gt;..... (list of cell information. For details, see Examples.) &lt;CR&gt;&lt;LF&gt;..... (list of cell information. For details, see Examples.) &lt;CR&gt;&lt;LF&gt;...(enter any character to stop periodical return of the list of cell information)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt; (For details, see Examples.)</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

"Limited service" or "Searching" may be returned only when the module is unsolicitedly searching for or deregistering with the network.

## 8.9.4 Examples

Example 1:

Obtain the parameter range.

```
AT^SMONG=?
```

```
^SMONG: (1),(1-100)
```



OK

Example 2:

Obtain the list of cell information.

AT^SMONG

GPRS Monitor

BCCH # cell #	G	PBCCH	PAT	MCC	MNC	NOM	TA	RAC
552	1	-	6	460	09	1	255	00

OK

Example 3:

Periodically obtain the list of cell information.

AT^SMONG=1,1

GPRS Monitor

BCCH # cell #	G	PBCCH	PAT	MCC	MNC	NOM	TA	RAC
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
BCCH # cell #	G	PBCCH	PAT	MCC	MNC	NOM	TA	RAC
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00



552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
BCCH	G	PBCCH	PAT	MCC	MNC	NOM	TA	RAC
# cell #								
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00
552	1	-	6	460	09	1	255	00

e (enter the letter e to stop information return and an echo is returned)

OK

## 8.10 AT^SPLM - Command for Reading the PLMN List

The **AT^SPLM** command reads the PLMN list.

## 8.10.1 Checking Whether This Command Is Available

<b>Test command</b>	AT^SPLM=?
<b>Function</b>	Checks whether this command is available.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

## 8.10.2 Querying the List of Operator Names Saved on the ME

<b>Execution command</b>	AT^SPLM
<b>Function</b>	Queries the list of operator names saved on the ME.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;^SPLM: &lt;numeric&gt;,&lt;alphan&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;[^SPLM:...]&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<numeric>: indicates an operator in numeric format (for details, see **AT+COPS**).

<alphan>: indicates an operator in long string format (for details, see **AT+COPS**).

## 8.10.3 Examples

Example:

Query the list of operators saved on the ME.

AT^SPLM

^SPLM: "36320", "DIGICEL"

...<The information is omitted due to its excessive length>

OK

## 8.11 AT+CPOL - Command for Setting the List of Preferred Operators

The **AT+CPOL** command sets the list of preferred operators.

### 8.11.1 Checking the Parameter Range Supported by This Command

<b>Test command</b>	AT+CPOL=?
<b>Function</b>	Returns the parameter range supported by this command.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CPOL: (list of supported &lt;index&gt;s),(list of supported &lt;format&gt;s)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<index>: sequence number of an operator from the list of preferred operators on the SIM card.

<format>: integer, which indicates the format of operator name.

- 0: operator information **<oper>** in long string format, which consists of not more than 16 characters.
- 1: operator information in short string format. Currently, the operator information in short string format and in long string format has the same meaning.
- 2 (default value): operator information **<oper>** in numeric format.



## 8.11.2 Querying the List of Preferred Operators

**Read command** AT+CPOL?

**Function** Queries the list of preferred operators.

**Response**

- In case of successful execution:  
<CR><LF>[+CPOL:<index>,<format>,<operator>]<CR><LF>  
<CR><LF> [+CPOL:...]<CR><LF>  
<CR><LF>OK<CR><LF>
- In case of an error during command execution:  
<CR><LF>ERROR<CR><LF>
- In case of an error related to the MT during command execution:  
<CR><LF>+CME ERROR: <err><CR><LF>

### Parameter description

<operator>: indicates an operator name in numeric format.

## 8.11.3 Setting the List of Preferred Operators

**Write command** AT+CPOL=<index>[,<format>,<operator>]

**Function** Sets the list of preferred operators.

**Response**

- In case of successful execution: <CR><LF>OK<CR><LF>
- In case of an error during command execution:  
<CR><LF>ERROR<CR><LF>
- In case of an error related to the MT during command execution:  
<CR><LF>+CME ERROR: <err><CR><LF>

### Note:

You can set <format> in AT+CPOL=,<format>.

## 8.11.4 Examples

Example:

Add a preferred operator.

AT+CPOL=1,2,46000

OK



## 8.12 AT^SPLR - Command for Querying Preferred Operators

The **AT^SPLR** command queries preferred operators.

### 8.12.1 Checking the Parameter Range Supported by This Command

<b>Test command</b>	AT^SPLR=?
<b>Function</b>	Returns the parameter range supported by this command.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;^SPLR: (list of supported &lt;indexa&gt;s)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<indexa>: sequence number range supported by the SIM card.

### 8.12.2 Querying the Current Range of Preferred Operators

<b>Write command</b>	AT^SPLR=<index1>[,<index2>]
<b>Function</b>	Queries the current status of network registration.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;^SPLR:&lt;index1&gt;&lt;oper&gt;&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;^SPLR:&lt;index2&gt;&lt;oper&gt;&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Note:

The system returns a single record or multiple consecutive records of the list of preferred operators on the SIM card that are read according to the index. If index1 and index2 are entered, all records from index1 to index2 (index1 and index2 included) are returned. If index2 is not entered, the single record index1 is returned.

#### Parameter description

<index1>: start sequence number in the list of preferred operators.

<index2>: end sequence number in the list of preferred operators. The value of <index2> must be larger than that of <index1>. Otherwise, the ERROR is returned.

<oper>: indicates an operator name in numeric format.

### 8.12.3 Examples

Example:

Read the current range of preferred operators.

```
AT^SPLR=1,2
```

```
^SPLR:1."46000"
```

```
^SPLR:2."46001"
```

OK

## 8.13 AT^SPLW - Command for Writing Preferred Operators

The **AT^SPLW** command writes preferred operators.

### 8.13.1 Checking the Parameter Range Supported by This Command

**Test command** AT^SPLW=?

**Function** Returns the parameter range supported by this command.

**Response**

- In case of successful execution:  
<CR><LF>^SPLW: (list of supported <index>s) <CR><LF>  
<CR><LF>OK<CR><LF>
- In case of an error during command execution:  
<CR><LF>ERROR<CR><LF>
- In case of an error related to the MT during command execution:  
<CR><LF>+CME ERROR: <err><CR><LF>

#### Parameter description

<index>: sequence number of location



## 8.13.2 Writing the Information About Preferred Operators

**Write command** AT^SPLW=<index>[,<oper>]

**Function** Writes the information about preferred operators.

**Response**

- In case of successful execution: <CR><LF>OK<CR><LF>
- In case of an error during command execution: <CR><LF>ERROR<CR><LF>
- In case of an error related to the MT during command execution: <CR><LF>+CME ERROR: <err><CR><LF>

**Note:**

- An operator name is written to the specified location of the list of preferred operators on the SIM card. If the oper field does not exist, the record of the current index is deleted from the list.
- Each piece of oper information can correspond to only one record in the list. Otherwise, the ERROR is returned.

**Parameter description**

<oper>: indicates an operator name in numeric format.

## 8.13.3 Examples

Example:

Write a record into the list of preferred operators.

AT^SPLW=1,46000

OK

## 8.14 AT+CNUM - Command for Querying Subscriber Numbers

The **AT+CNUM** command queries subscriber numbers. This information is stored in the **EF<sub>MSISDN</sub>** file in the **DFTelecom** directory on the SIM card. If a subscriber subscribes to different services, the subscriber corresponds to different MSISDNs, each of which is returned as a single line.

## 8.14.1 Checking Whether This Command Is Available

<b>Test command</b>	AT+CNUM=?
<b>Function</b>	Checks whether this command is available.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of available command: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of unavailable command: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li></ul>

## 8.14.2 Querying the MSISDN Related to Subscribers

<b>Execution command</b>	AT+CNUM
<b>Function</b>	Reads the mobile station international ISDN number (MSISDN) related to subscribers.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: [+CNUM: [&lt;alpha1&gt;,&lt;number1&gt;,&lt;type1&gt;[,&lt;speed&gt;,&lt;service&gt;[,&lt;itc&gt;]] [&lt;CR&gt;&lt;LF&gt;+CNUM: [&lt;alpha2&gt;,&lt;number2&gt;,&lt;type2&gt;[,&lt;speed&gt;,&lt;service&gt; [,&lt;itc&gt;]]][...]]&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<alphax>: subscriber name of the local phone number. The subscriber name is a string consisting of digits and characters and the used character set is the value set by **+CSCS**.

<numberx>: phone number string type that is defined according to the **<typex>** format and consists of digits 0–9 and the + symbol.

<typex>: type of the local phone number. An 8-digit address type in integer format. When **<numberx>** contains the + symbol, the value of **<typex>** is **145**, indicating an international phone number. When **<numberx>** does not contain the + symbol, the value of **<typex>** is **129**, indicating a phone number of the home country.

<speed>: not supported currently.

- 0: adaptive baud rate
- 7: 9600 bit/s (V.32)
- 71: 9600 bit/s (V.110)

<service>: services related to the phone number, which are not supported currently.

- 0: asynchronous modem 1: synchronous modem
- 2: PAD Access (asynchronous)
- 3: Packet Access (synchronous)

<itc>: information transmission capability, which is not supported currently.

- 0: 3.1 kHz
- 1: UDI

### 8.14.3 Examples

Example 1:

Query the MSISDN related to subscribers.

Write two local phone numbers onto the SIM card.

AT+CPBS="ON"

OK

AT+CPBW=1,"13903702769",145

OK

Query the MSISDN.

AT+CNUM

+CNUM: "", "+13903702769",145

OK

Example 2:

Clear the local phone numbers.

AT+CPBS="ON"

OK

AT+CPBW=1

OK

AT+CNUM

OK

# 9

## Commands for Data Services

This chapter describes the AT commands that set and operate data services.

### 9.1 AT+CGACT - Command for Activating or Deactivating the PDP Context

After **AT+CGACT** (command for activating or deactivating the PDP context) is successfully executed, the MT remains in V.250 command state. If the PDP context is in request state, the state remains unchanged. When the activation form of this command is executed, if the MT has not been attached to the GPRS, the MT must perform GPRS attachment before attempting to activate the specified PDP context. If **<cid>** is not specified, all PDP contexts are activated or deactivated.

#### 9.1.1 Querying the Supported Status of PDP Context

<b>Test command</b>	AT+CGACT=?
<b>Function</b>	Queries the supported status of PDP context.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CGACT: (list of supported &lt;state&gt;s)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<state>: numeric parameter, which indicates the activation state of the PDP context.

0: deactivation

1: activation



## 9.1.2 Reading the Activation State of the PDP Context

<b>Read command</b>	AT+CGACT?
<b>Function</b>	Reads the activation state of the specified PDP context.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: [&lt;CR&gt;&lt;LF&gt;+CGACT:&lt;cid&gt;&lt;state&gt;&lt;CR&gt;&lt;LF&gt; [&lt;CR&gt;&lt;LF&gt;+CGACT:&lt;cid&gt;&lt;state&gt;&lt;CR&gt;&lt;LF&gt;]] &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<cid>: numeric parameter; value range: 1–3; this parameter indicates the PDP context identification. For a TE-MT interface, this parameter is local and can be used for other commands related to the PDP context.

## 9.1.3 Setting the Activation State of the PDP Context

<b>Write command</b>	AT+CGACT=[<state>[,<cid>[,<cid>]]]
<b>Function</b>	Sets the status of the PDP context.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Note:

- To hang up the dialing of a data service through AT commands, first send AT+CGACT to deactivate the PDP context, and then send ATH to hang up the data service.
- In this section, AT+CGACT= is equivalent to AT+CGACT=1 (<state>=1).

## 9.1.4 Examples

Example 1:

Define the PDP context.

```
AT+CGDCONT=1,"IP","1234"
```

OK

Read the activation state of the PDP context.



AT+CGACT?

+CGACT: 1,0

OK

Example 2:

Set to activate the PDP context.

AT+CGACT=1,1

OK

Read the activation state of the PDP context.

AT+CGACT?

+CGACT:1,1

OK

## 9.2 AT+CGATT - Command for Attaching the MT to or Detaching the MT from the GPRS Service

The **AT+CGATT** command attaches the MT to the GPRS service or detaches the MT from the GPRS service. After this command is successfully executed, the MT remains in V.250 command state. If the MT is in request state, this command is ignored and OK is returned. When the attachment state is changed to the detachment state, all PDP contexts are deactivated automatically.

### 9.2.1 Checking the Supported GPRS Service State

<b>Test command</b>	AT+CGATT=?
<b>Function</b>	Checks the supported GPRS service state.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CGATT: (list of supported &lt;state&gt;s)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<state>: character type parameter, which indicates the GPRS attachment state.



0: detachment state

1: attachment state

## 9.2.2 Querying the Current GPRS Service State

<b>Read command</b>	AT+CGATT?
<b>Function</b>	Queries the current GPRS service state.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CGATT: &lt;state&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of failed command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

## 9.2.3 Setting the GPRS Service State

<b>Write command</b>	AT+CGATT=[<state>]
<b>Function</b>	Sets the GPRS service state.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

In this section, AT+CGATT= is equivalent to AT+CGATT=1 (<state>=1).

## 9.2.4 Examples

Example 1:

Read the GPRS attachment state.

AT+CGATT?

+CGATT: 1

OK

Example 2:

Set the GPRS detachment state.

AT+CGATT=0

OK

## 9.3 AT+CGEREP - Command for Reporting GPRS Events

The **AT+CGEREP** command sets the unsolicited reporting of GPRS events. When certain events occur on the GPRS MT or the network, this command can enable or disable the sending of **URC+CGEV: XXX** from the MT to the TE. For the +CGEV reporting command, refer to section 9.11 .

### 9.3.1 Checking the Supported GPRS Event Reporting Mode

<b>Test command</b>	AT+CGEREP=?
<b>Function</b>	Checks the supported GPRS event reporting mode.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CGEREP: (list of &lt;mode&gt;s),(list of supported &lt;bfr&gt;s)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<mode>: numeric parameter.

- 0: buffers the URCs on the MT. If the buffer is full, the oldest URC is discarded and URCs are not sent to the TE.
- 1: When the MT-TE link is reserved (for example, in online data mode), URCs are discarded. Otherwise, URCs are directly forwarded to the TE.
- 2: When the MT-TE link is reserved (for example, in online data mode), URCs are buffered. After the MT-TE link is available, all URCs are sent to the TE. Otherwise, URCs are directly forwarded to the TE. If the buffer is full, the oldest URC is discarded.

<bfr>: numeric parameter.

- 0: When the entered value of the **<mode>** parameter is **1** or **2**, the URC buffer defined by this command is cleared.
- 1: When the entered value of the **<mode>** parameter is **1** or **2**, the URC buffer defined by this command is fully sent to the TE (OK is returned before sending) and the buffer is cleared.



## 9.3.2 Reading the GPRS Event Reporting Mode

<b>Read command</b>	AT+CGEREP?
<b>Function</b>	Reads the GPRS event reporting mode.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CGEREP:&lt;br&gt;&lt;mode&gt;,&lt;bfr&gt;&lt;CR&gt;&lt;LF&gt;&lt;br&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR:&lt;br&gt;&lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

## 9.3.3 Setting the GPRS Event Reporting Mode

<b>Write command</b>	AT+CGEREP=[<mode>[,<bfr>]]
<b>Function</b>	Sets the GPRS event reporting mode.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt; OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR:&lt;br&gt;&lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

Unsolicited event reporting

URC 1

+CGEV: REJECT <PDP\_type>, <PDP\_addr>

The MT disables the reporting of **+CRING** to the TE. The request for activating the PDP context on the network is automatically rejected.

URC 2

+CGEV: NW REACT <PDP\_type>, <PDP\_addr>, [<cid>]

The network requests for re-activating the PDP context. The **<cid>** parameter is used to re-activate the PDP context.

URC 3

+CGEV: NW DEACT <PDP\_type>, <PDP\_addr>, [<cid>]

The network requests for deactivating the PDP context. The **<cid>** parameter is used to activate the PDP context.

URC 4

+CGEV: MT DEACT <PDP\_type>, <PDP\_addr>, [<cid>]

The MT requests for deactivating the PDP context. The **<cid>** parameter is used to activate the PDP context.

URC 5

+CGEV: NW DETACH

The network requests for GPRS detachment.

URC 6

+CGEV: MT DETACH

The MT requests for GPRS detachment.

URC 7

+CGEV: NW CLASS <class>

The network requests for changing the MS class and reports the class with the highest priority.

URC 8

+CGEV: MT CLASS <class>

The MT requests for changing the MS class and reports the class with the highest priority.

#### Parameter description

<class>: character type parameter, which indicates the GPRS class.

“B” class B

For details about the **<PDP\_type>**, **<PDP\_addr>**, and **<cid>** parameters, see the parameter description of the **AT+CGDCONT** command.

## 9.4 AT+CGDATA - Command for Entering the Data Mode

The **AT+CGDATA** command sets whether the MT uses one or more GPRS PDP types, performs related operations, and establishes communication between the TE and network.



## 9.4.1 Querying the Layer-2 Protocol Supported Between the TE and MT

<b>Test command</b>	AT+CGDATA=?
<b>Function</b>	Checks the layer-2 protocol supported between the TE and MT.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CGDATA: (list of supported &lt;L2P&gt;s)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<L2P>: character type parameter, which indicates the layer-2 protocol used between the TE and MT. The default value is **PPP**.

“PPP” layer-2 protocol

## 9.4.2 Establishing Communication Between the TE and Network

<b>Write command</b>	AT+CGDATA=[<L2P>[,<cid>[,<cid>]]]
<b>Function</b>	Establishes communication between the TE and network.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;CONNECT&lt;CR&gt;&lt;LF&gt;</li><li>• In case of failed communication establishment: &lt;CR&gt;&lt;LF&gt;NO CARRIER&lt;CR&gt;&lt;LF&gt;</li><li>• In case of failed command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<cid>: numeric parameter, which indicates the index value of the PDP context; value range: 1–3. Other commands related to the PDP context can invoke the saved settings through this index value. For a TE-MT interface, this parameter is local and can be used for other commands related to the PDP context. If **<cid>** is not specified or the defined PDP context is not matched, the MT activates the PDP context of IP type. Other parameters retain the default values (for details, see **AT+CGDCONT**, **AT+CGQREQ**, and **AT+CGQMIN**).



## 9.4.3 Examples

Example:

Define the PDP context.

```
AT+CGDCONT=1,"IP","1234"
```

OK

Query the defined PDP context.

```
AT+CGDCONT?
```

```
+CGDCONT:1,"IP","1234","0.0.0.0",0,0
```

OK

Establish the communication.

```
AT+CGDATA="PPP",1
```

CONNECT

Run **+++** to quit the data mode and enter the command mode.

## 9.5 AT+CGDCONT - Command for Defining the PDP Context

The **AT+CGDCONT** command defines the PDP context. The MT locally saves a group of PDP contexts with **<cid>** as the index. Each record of the saved setting environment contains a group of PDP related parameters. The write command saves the group of PDP related parameters in the PDP contexts that use **<cid>** as the index. Each PDP context is initially undefined. After the write command saves a group of parameters in a PDP context, the PDP context is defined. The number of defined PDP contexts that can be saved at the same time is determined by the value range of **<cid>**.

If **AT+CGDCONT= <cid>** is sent, all parameters in the PDP contexts indicated by **<cid>** are cleared. In this case, the PDP contexts become undefined again.



## 9.5.1 Querying the Range of PDP Related Parameters

<b>Test command</b>	AT+CGDCONT=?
<b>Function</b>	Returns the parameter range supported by this command.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CGDCONT: (range of supported &lt;cid&gt;s),&lt;PDP_type&gt;,,,(list of supported&lt;d_comp&gt;s),(list of supported&lt;h_homp&gt;s) &lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<cid>: numeric parameter, which indicates the index value of the PDP context. Other commands related to the PDP context can invoke the saved settings through this index value. For a TE-MT interface, this parameter is local and can be used for other commands related to the PDP context.

Value range: 1–3

<PDP\_type>: character type parameter, which indicates the type of packet exchange protocol.

“IP”: Internet Protocol (IP)

<APN>: character type parameter, which indicates the domain name of the access point that connects to the GGSN or external networks.

<PDP\_addr>: character type parameter. This parameter identifies the address that is assigned to the specified PDP context. If the value of this parameter is null or omitted, the TE provides other address during the PDP startup process. Otherwise, a dynamic address must be requested. Even if an address is assigned during PDP establishment, null is returned after the read command is sent. To read this address, run **AT+CGPADDR**.

<d\_comp>: numeric parameter, which controls the data compression of PDP (available for SNDTCP only. For details, see the 3GPP TS 44.065.)

0 (default value): no compression

<h\_comp>: numeric parameter, which controls the head compression of PDP (for details, see the 3GPP TS 44.065 and 3GPP TS 25.323).

0 (default value): no compression





## 9.5.2 Reading the Status of the PDP Context

<b>Read command</b>	AT+CGDCONT?
<b>Function</b>	Reads the status of the PDP context.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: [&lt;CR&gt;&lt;LF&gt;+CGDCONT:&lt;cid&gt;,&lt;PDP_type&gt;,&lt;APN&gt;,&lt;PDP_addr&gt;,&lt;d_comp&gt;,&lt;h_comp&gt; [&lt;CR&gt;&lt;LF&gt;+CGDCONT: ...&lt;CR&gt;&lt;LF&gt;]]&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

## 9.5.3 Setting the Status of the PDP Context

<b>Write command</b>	AT+CGDCONT=[<cid>[,<PDP_type>[,<APN>[,<PDP_addr>]]]]
<b>Function</b>	Sets the status of the PDP context.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

## 9.5.4 Examples

Example:

Define the PDP context.

```
AT+CGDCONT=1,"IP","1234"
```

OK

Query the defined PDP context.

```
AT+CGDCONT?
```

```
+CGDCONT:1,"IP","1234","",0,0
```

OK



## 9.6 AT+CGPADDR - Command for Reading the PDP Address

The **AT+CGPADDR** command reads the PDP address. This command can return the PDP address list of the specified PDP context identification **<cid>**. If **<cid>** is omitted, the addresses of all defined PDP contexts are returned.

### 9.6.1 Querying the Supported PDP Index Value

<b>Test command</b>	AT+CGPADDR=?
<b>Function</b>	Checks the parameter range supported by this command.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: [&lt;CR&gt;&lt;LF&gt;+CGPADDR: (list of supported &lt;cid&gt;s) &lt;CR&gt;&lt;LF&gt;] &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

**<cid>**: numeric parameter, which indicates the index value of the PDP context; value range: 1–3. Other commands related to the PDP context can invoke the saved settings through this index value. For a TE-MT interface, this parameter is local and can be used for other commands related to the PDP context.

**<PDP\_addr>**: character type parameter, which indicates the PDP address. The PDP address can be a static or dynamic address.

### 9.6.2 Reading the PDP Address List of the Specified PDP Context

This command reads the PDP address list of the specified PDP context.

<b>Write command</b>	AT+CGPADDR=[<cid>[,<cid>]]
<b>Function</b>	Reads the PDP address list of the specified PDP context.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: [&lt;CR&gt;&lt;LF&gt;+CGPADDR: &lt;cid&gt;,&lt;PDP_addr&gt;&lt;CR&gt;&lt;LF&gt; [&lt;CR&gt;&lt;LF&gt;+CGPADDR: &lt;cid&gt;,&lt;PDP_addr&gt;&lt;CR&gt;&lt;LF&gt;]] &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>



## 9.6.3 Examples

Example:

Define the PDP context.

```
AT+CGDCONT=1,"IP","1234"
```

OK

Activate the PDP context.

```
AT+CGACT=1,1
```

OK

Read the PDP address.

```
AT+CGPADDR=1
```

```
+CGPADDR:1,"192.168.50.64"
```

OK

## 9.7 AT+CGQMIN - Command for Setting the Acceptable Minimum Quality of Service Profile

The **AT+CGQMIN** command allows the TE to specify an acceptable minimum quality of service (QoS). This profile is verified by the MT and is compared with the negotiation profile returned by the "PDP context activation" message.

The write command can specify a profile for the context. This profile is identified by the (local) context identification parameter **<cid>**. If **AT+CGQMIN= <cid>** is sent, the defined QoS of **<cid>** is deleted.



## 9.7.1 Querying the Supported QoS Parameter Range

<b>Test command</b>	AT+CGQMIN=?
<b>Function</b>	Queries the supported QoS parameter range.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: [&lt;CR&gt;&lt;LF&gt;+CGQMIN: &lt;PDP_type&gt;,(list of supported&lt;precedence&gt;s),(list of supported &lt;delay&gt;s),(list of supported &lt;reliability&gt;s),(list of supported &lt;peak&gt;s),(list of supported &lt;mean&gt;s)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<cid>: numeric parameter, which indicates the index value of the PDP context; value range: 1–3. For a TE-MT interface, this parameter is local and can be used for other commands related to the PDP context.

<precedence>: numeric parameter, which specifies the priority level.

- 0 (default value): network customization parameter
- 1: higher than priority levels 2 and 3; implements service commitments with high priority.
- 2: higher than priority level 3; implements service commitments with medium priority.
- 3: implements service commitments with low priority.

<delay>: numeric parameter, which indicates the delay level; value range: 0–4; this parameter defines the delay of SDU transmission on the GPRS network.

0 (default value): network customization parameter

When the size of SDU is 128 octets:

Delay Level	Average Transmission Delay	95 Percentile
1(Predictive)	<0.5	<1.5
2(Predictive)	<5	<25
3(Predictive)	<50	<250
4(Best Effort)	Unspecified	

When the size of SDU is 1024 octets:

Delay Level	Average Transmission Delay	95 Percentile
1(Predictive)	<0.5	<1.5
2(Predictive)	<5	<25
3(Predictive)	<50	<250
4(Best Effort)	Unspecified	

<reliability>: integer, which specifies the reliability level of processing uncommon data loss.

0 (default value): network customization parameter

1: cannot process non-real-time services and error-sensitive applications for data loss

2: can process non-real-time services and error-sensitive applications for data loss

3: can process non-real-time services and error-sensitive applications for data loss, GMM/SM, and SMS

4: can process real-time services and error-sensitive applications for data loss

5: can process real-time services and error-sensitive applications for data loss

<peak>: integer, which specifies the peak throughput level (octets/s).

0 (default value): network customization parameter

1: maximum 1000 (8 Kbit/s)

2: maximum 2000 (16 Kbit/s)

3: maximum 4000 (32 Kbit/s)

4: maximum 8000 (64 Kbit/s)

5: maximum 16000 (128 Kbit/s)

6: maximum 32000 (256 Kbit/s)

7: maximum 64000 (512 Kbit/s)

8: maximum 128000 (1024 Kbit/s)

9: maximum 256000 (2048 Kbit/s)

<PDP\_type>: type of packet data protocol. String parameter

"IP"

<mean>: integer, which indicates the average throughput level.

0 (default value): network customization parameter

1: 100 (about 0.22 bit/s)

2: 200 (about 0.44 bit/s)

- 3: 500 (about 1.11 bit/s)
- 4: 1000 (about 2.2 bit/s)
- 5: 2000 (about 4.4 bit/s)
- 6: 5000 (about 11.1 bit/s)
- 7: 10000 (about 22 bit/s)
- 8: 20000 (about 44 bit/s)
- 9: 50000 (about 111 bit/s)
- 10: 100000 (about 0.22 Kbit/s)
- 11: 200000 (about 0.44 Kbit/s)
- 12: 500000 (about 1.11 Kbit/s)
- 13: 1000000 (about 2.2 Kbit/s)
- 14: 2000000 (about 4.4 Kbit/s)
- 15: 5000000 (about 11.1 Kbit/s)
- 16: 10000000 (about 22 Kbit/s)
- 17: 20000000 (about 44 Kbit/s)
- 18: 50000000 (about 111 Kbit/s)
- 31: maximum throughput (best effort)

## 9.7.2 Querying the Minimum QoS of All PDP Contexts

**Read command** AT+CGQMIN?

**Function** Queries the minimum QoS of all PDP contexts.

**Response**

- In case of successful execution:  
[<CR><LF>+CGQMIN:  
<cid>,<precedengce>,<delay>,<reliability>,<peak>,<mean><CR><LF>  
[<CR><LF> +CGQMIN: ...<CR><LF>]]  
<CR><LF>OK<CR><LF>
- In case of an error during command execution:  
<CR><LF>ERROR<CR><LF>
- In case of an error related to the MT during command execution:  
<CR><LF>+CME ERROR: <err><CR><LF>

## 9.7.3 Setting the Minimum QoS of a PDP Context

<b>Write command</b>	AT+CGQMIN=[<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]]
<b>Function</b>	Sets the minimum QoS of a PDP context.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

If no parameters of this command are set, AT+CGQMIN= considers the previously set values valid for various parameters.

## 9.8 AT+CGQREQ - Command for Setting the Requested QoS Profile

The **AT+CGQREQ** command allows the TE to specify a QoS level when the MT sends the “PDP context activation request” message to the network. The write command can specify a profile for the context. This profile is identified by the (local) context identification parameter <cid>. If **AT+CGQREQ= <cid>** is sent, the defined QoS of <cid> is deleted.

### 9.8.1 Checking the Parameter Range Supported by the Command

<b>Test command</b>	AT+CGQREQ=?
<b>Function</b>	Queries the parameter range supported by the command.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CGQREQ: &lt;PDP_type&gt;,(list of supported &lt;precedence&gt;s),( list of supported &lt;delay&gt;s), (list of supported &lt;reliability&gt;s), (list of supported &lt;peak&gt;s), (list of supported &lt;mean&gt;s)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<cid>: numeric parameter, which indicates the index value of the PDP context; value range: 1–3. For a TE-MT interface, this parameter is local and can be used for other commands related to the PDP context.

<precedence>: numeric parameter, which specifies the priority level.

- 0 (default value): network customization parameter
- 1: higher than priority levels 2 and 3; implements service commitments with high priority.
- 2: higher than priority level 3; implements service commitments with medium priority.
- 3: implements service commitments with low priority.

<delay>: numeric parameter, which indicates the delay level; value range: 0–4; this parameter defines the delay of SDU transmission on the GPRS network.

0 (default value): network customization parameter

When the size of SDU is 128 octets:

Delay Level	Average Transmission Delay	95 Percentile
1(Predictive)	<0.5	<1.5
2(Predictive)	<5	<25
3(Predictive)	<50	<250
4(Best Effort)	Unspecified	

When the size of SDU is 1024 octets:

Delay Level	Average Transmission Delay	95 Percentile
1(Predictive)	<0.5	<1.5
2(Predictive)	<5	<25
3(Predictive)	<50	<250
4(Best Effort)	Unspecified	

<reliability>: integer, which specifies the reliability level of processing uncommon data loss.

- 0 (default value): network customization parameter
- 1: cannot process non-real-time services and error-sensitive applications for data loss
- 2: can process non-real-time services and error-sensitive applications for data loss
- 3: can process non-real-time services and error-sensitive applications for data loss, GMM/SM, and SMS



- 4: can process real-time services and error-sensitive applications for data loss
- 5: can process real-time services and error-sensitive applications for data loss
- <peak>: integer, which specifies the peak throughput level (octets/s).
- 0 (default value): network customization parameter
- 1: maximum 1000 (8 Kbit/s)
- 2: maximum 2000 (16 Kbit/s)
- 3: maximum 4000 (32 Kbit/s)
- 4: maximum 8000 (64 Kbit/s)
- 5: maximum 16000 (128 Kbit/s)
- 6: maximum 32000 (256 Kbit/s)
- 7: maximum 64000 (512 Kbit/s)
- 8: maximum 128000 (1024 Kbit/s)
- 9: maximum 256000 (2048 Kbit/s)

<PDP\_type>: type of packet data protocol. String parameter

"IP"

<mean>: integer, which indicates the average throughput level.

- 0 (default value): network customization parameter
- 1: 100 (about 0.22 bit/s)
- 2: 200 (about 0.44 bit/s)
- 3: 500 (about 1.11 bit/s)
- 4: 1000 (about 2.2 bit/s)
- 5: 2000 (about 4.4 bit/s)
- 6: 5000 (about 11.1 bit/s)
- 7: 10000 (about 22 bit/s)
- 8: 20000 (about 44 bit/s)
- 9: 50000 (about 111 bit/s)
- 10: 100000 (about 0.22 Kbit/s)
- 11: 200000 (about 0.44 Kbit/s)
- 12: 500000 (about 1.11 Kbit/s)
- 13: 1000000 (about 2.2 Kbit/s)
- 14: 2000000 (about 4.4 Kbit/s)
- 15: 5000000 (about 11.1 Kbit/s)
- 16: 10000000 (about 22 Kbit/s)
- 17: 20000000 (about 44 Kbit/s)
- 18: 50000000 (about 111 Kbit/s)
- 31: maximum throughput (best effort)



## 9.8.2 Querying All QoS Levels Specified by the TE

<b>Read command</b>	AT+CGQREQ?
<b>Function</b>	Queries all QoS levels specified by the TE when the MT sends the "PDP context activation request" message to the network.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: [&lt;CR&gt;&lt;LF&gt;+CGQREQ: &lt;cid&gt;,&lt;precedence&gt;,&lt;delay&gt;,&lt;reliability&gt;,&lt;peak&gt;,&lt;mean&gt;&lt;CR&gt;&lt;LF&gt; [&lt;CR&gt;&lt;LF&gt; +CGQREQ: ...&lt;CR&gt;&lt;LF&gt;]] &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

## 9.8.3 Setting the QoS of a PDP Context

<b>Write command</b>	AT+CGQREQ=[<cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>]]]]]
<b>Function</b>	Sets the QoS of a PDP context.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

If no parameters of this command are set, AT+CGQREQ= considers the previously set values valid for various parameters.

## 9.9 AT+CGREG - Command for Setting Whether to Report the GPRS Network Registration Status

The **AT+CGREG** command sets the unsolicited reporting upon change of the GPRS registration status.

## 9.9.1 Checking the Parameter Range Supported by this Command

<b>Test command</b>	AT+CGREG=?
<b>Function</b>	Checks the parameter range supported by this command.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CGREG:(list of supported &lt;n&gt;s)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<n>: numeric parameter.

- 0 (default value): disables the URC
- 1: enables the URC "+CGREG:<stat>"
- 2: enables the URC "+CGREG:<stat>[<lac>,<ci>]"

<lac>: Location Area Code (LAC)

<ci>: Cell Identity (CI)

## 9.9.2 Querying the Parameters Unsolicitedly Reported When the Current GPRS Registration Status Changes

<b>Read command</b>	AT+CGREG?
<b>Function</b>	Queries the parameters unsolicitedly reported when the current GPRS registration status changes.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: When &lt;n&gt; is not set to 2: &lt;CR&gt;&lt;LF&gt;+CGREG: &lt;n&gt;,&lt;state&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt; When &lt;n&gt; is set to 2: &lt;CR&gt;&lt;LF&gt;+CGREG: &lt;n&gt;,&lt;state&gt;,&lt;lac&gt;,&lt;ci&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Parameter description**

<stat>: numeric parameter, GPRS registration status.

- 0: has not been registered and the ME does not search for a new network currently. The ME is in GMM-NULL or GMM-DEREGISTERED-INITIATED state. The GPRS service is disabled and the subscriber can request the ME to attach to the GPRS.
- 1: has been registered with the local network.
- 2: has not been registered but the ME is searching for a new network. The ME is in GMM-NULL or GMM-DEREGISTERED-INITIATED state. The GPRS service is enabled but no available PLMN exists. After an available PLMN exists, the ME immediately attaches to the GPRS.
- 3: Registration is rejected. The GPRS service is disabled and the ME cannot be attached to the GPRS.
- 4: unknown.
- 5: has been registered with the roaming network.

### 9.9.3 Setting the Parameters Unsolicitedly Reported When the GPRS Registration Status Changes

<b>Write command</b>	AT+CGREG=[<n>]
<b>Function</b>	Sets the parameters unsolicitedly reported when the GPRS registration status changes.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

- When the ME has been attached to the GPRS, if the PLMN reselects a network that does not support GPRS or a network where the SIM card disables the GPRS application, this command still returns the current status as follows: <stat>=1 or <stat>=5.
- URC: When the GPRS network registration status of the ME changes, the following status is returned:
- +CGREG:<stat>
- If no parameters of this command are set, AT+CGREG= considers the previously set values valid for various parameters.

### 9.9.4 +CGREG – Command for Reporting Unsolicitedly

<b>URC</b>	<CR><LF>+CGREG: <stat><CR><LF>
<b>Function</b>	Indicates that the GPRS network registration status of the ME is changed.



## 9.10 AT+CGSMS - Command for Selecting the MO SMS Bearer Domain

The **AT+CGSMS** command sets the MT SMS bearer domain.

### 9.10.1 Querying the Supported SMS Bearer Domains

<b>Test command</b>	AT+CGSMS=?
<b>Function</b>	Queries the supported SMS bearer domains.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CGSMS:(list of supported &lt;service&gt;s)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT during command execution: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<service>: numeric parameter.

- 0: GPRS
- 1: CS domain
- 2: GPRS is preferred (if GPRS is unavailable, CS domain is used.)
- 3 (default value): CS domain is preferred (if CS domain is unavailable, GPRS is used.)

### 9.10.2 Reading the Current SMS Bearer Domain

<b>Read command</b>	AT+CGSMS?
<b>Function</b>	Reads the current settings.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CGSMS:&lt; service&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>



### 9.10.3 Setting the SMS Bearer Domain

<b>Write command</b>	AT+CGSMS=[<service>]
<b>Function</b>	Sets the SMS bearer domain.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

If no parameters of this command are set, AT+CGSMS= considers the previously set values valid for various parameters.

## 9.11 +CGEV – Command for Unsolicitedly Reporting GPRS MT or Network Events

When an event related to the GPRS MT or network occurs, the MT unsolicitedly reports +CGEV.

- URC1** When the MT is forbidden from reporting +CRING to the TE, the PDP context activation request of the network is automatically rejected.  
<CR><LF>+CGEV: REJECT <PDP\_type>, <PDP\_addr><CR><LF>
- URC2** The network requests for re-activating the PDP context.  
<CR><LF>+CGEV: NW REACT <PDP\_type>, <PDP\_addr>,  
[<cid>]<CR><LF>
- URC3** The network initiates PDP context deactivation.  
<CR><LF>+CGEV: NW DEACT <PDP\_type>, <PDP\_addr>,  
[<cid>]<CR><LF>
- URC4** The MT initiates PDP context deactivation.  
<CR><LF>+CGEV: MT DEACT <PDP\_type>, <PDP\_addr>,  
[<cid>]<CR><LF>
- URC5** The network initiates a GPRS detach procedure.  
<CR><LF>+CGEV: NW DETACH<CR><LF>
- URC6** The MT initiates a GPRS detach procedure.  
<CR><LF>+CGEV: MT DETACH<CR><LF>
- URC7** When the network initiates an MS class change, the class with the highest priority is reported.  
<CR><LF>+CGEV: NW CLASS <class><CR><LF>
- URC8** When the MT initiates an MS class change, the class with the highest priority is reported.  
+CGEV: MT CLASS <class>

#### Parameter description

<cid> is used to re-activate the PDP context.

<class>: character type, which indicates the GPRS class.

“B” class B

For the description of <PDP\_type>, <PDP\_addr>, and <cid>, see the parameter description of the **AT+CGDCONT** command.

# 10

## Commands for Internet Services

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Internet service, also known as IPSTACK service, means the service of using the TCP/IP protocol stack embedded in the MG323 to perform data services. The Internet service allows the host to access the Internet more easily through AT commands. This chapter describes all the AT commands that are covered by the TCP/IP protocol.

Currently, the MG323 supports Internet services for the Socket client/server of TCP and the Socket client of UDP only.

Only the URC mode is supported for Internet services.

The URC mode means that the Internet service process is driven by the URC. The URC notifies the host of whether the data can be sent or received, whether data transmission is complete, whether the service can be disabled, and whether an error occurs.

### 10.1 AT^SICS - Command for Creating a Connection Profile

The **AT^SICS** command can create and edit a connection profile.

#### 10.1.1 Checking Whether the SICS Command Is Available

<b>Test command</b>	AT^SICS=?
<b>Function</b>	Checks whether the SICS command is available.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of available command: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of unavailable command: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li></ul>





## 10.1.2 Reading the Information About Connection Profiles

**Read command**     AT^SICS?

**Function**     Reads the status of all connection profiles.

**Response**

- In case of successful execution:  
<CR><LF>^SICS:<conProfileId>,<conParmTag>,<conParmValue><CR><LF>  
<CR><LF>OK<CR><LF>
- In case of an error during command execution:  
<CR><LF>ERROR<CR><LF>
- In case of an error related to the MT during command execution:  
<CR><LF>+CME ERROR: <err><CR><LF>

### Parameter description

<conProfileId>: integer, which identifies a connection profile. Value range: 0–5.

<conParaTag>: string, which indicates the configurable items of a connection profile.

**Table 10-1** Parameter names supported by conType in CSD and GPRS0

	CSD (Not Supported Currently)	GPRS0
"conType"	Mandatory	Mandatory
"user" (not supported currently)	Optional	Optional
"passwd"	Optional	Optional
"apn"	/	Mandatory
"inactTO"	Optional	Optional
"calledNum" (not supported currently)	Mandatory	/
"dataType" (not supported currently)	Mandatory	/
"dns1" (not supported currently)	Optional	Optional
"dns2" (not supported currently)	Optional	Optional
"alphabet" (not supported currently)	Optional	Optional

<conParmValue>: corresponds to the value of **conParmTag**.

The meanings of different values of **conParmTag** and the value range of the corresponding **conParmValue** are as follows:

"conType": connection mode of the profile; string; value options are as follows:

- "CSD": data call in circuit switched domain (not supported currently)

- “GPRS0”: GPRS connection
- “none”: clears connection profiles

“apn”: access point name in character type, which consists of not more than 100 characters (the default value is a null string).

“user”: user name in character type, which consists of not more than 32 characters (the default value is a null string). This parameter is not supported currently.

“alphabet”: selects the settings for input and output character parameters in the profile. This parameter is not supported currently.

- “0” (default value): Character settings depend on **AT+CSCS**.
- “1”: international reference alphabet (IRA, 7-bit ASCII)

“passwd”: password in character type, which consists of not more than 32 characters (the default value is \*\*\*\*\*).

“calledNum”: called BCD number, which is not supported currently.

“dataType”: data call type, which is not supported currently.

- “0” : ISDN
- “1” (default value): analog

“dns1”: preferred DNS server address (IP address in the format of four dot-separated bytes), which is not supported currently.

“dns2”: alternative DNS server address (IP address in the format of four dot-separated bytes), which is not supported currently.

### 10.1.3 Setting the Internet Connection Profile

**Write command**     AT^SICS=<conProfileId>,<conParmTag><conParmValue>

**Function**         Sets all parameters of the internet connection profile.

**Response**         • In case of successful execution:  
                         <CR><LF><CR><LF>OK<CR><LF>  
                         • In case of an error during command execution:  
                         <CR><LF>ERROR<CR><LF>  
                         • In case of an error related to the MT: <CR><LF>CME ERROR:  
                         <err><CR><LF>

**Note:**

You need to select the internet connection type through the “conType” value of <conParmTag> before setting other values of <conParmTag> because the value of “conType” determines the applicability of other values (excluding the <conParmValue-alphabet>) of <conParmTag>. The <conParmValue-alphabet> parameter can be set either before or after “conType”. The settings for all parameters of the profile are changeable.

### 10.1.4 Examples

Example 1:

Query the status of the connection profile.

AT^SICS?

^SICS: 0,"conType","GPRS0"

^SICS: 0,"inactTO","20"

^SICS: 0,"alphabet","0"

^SICS: 0,"user",""

^SICS: 0,"passwd","\*\*\*\*\*"

^SICS: 0,"apn","1234"

^SICS: 0,"calledNum",""

^SICS: 1,"conType",""

^SICS: 2,"conType",""

^SICS: 3,"conType",""

^SICS: 4,"conType",""

^SICS: 5,"conType",""

OK

Example 2:

Set the connection profile.

AT^SICS=0,conType,GPRS0  
is **0** to **GPRS0**.

Set the value of **conType** for the profile whose ID is **0**

OK

AT^SICS=0,apn,1234  
to **1234**.

Set the value of **apn** for the profile whose ID is **0**

OK

## 10.2 AT^SICI - Command for Querying the Connection Profile

The **AT^SICI** command queries the status of the connection profile.

## 10.2.1 Querying the ID of the Defined Connection Profile

<b>Test command</b>	AT^SICI=?
<b>Function</b>	Queries the ID of the defined connection profile.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: [&lt;CR&gt;&lt;LF&gt;^SICI: (list of defined &lt;conProfileId&gt;s)&lt;CR&gt;&lt;LF&gt;] &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<conProfileId >: numeric parameter, which indicates the identification of the connection profile. Value range: 0–5.

## 10.2.2 Querying the Status of the Connection Profile

<b>Read command</b>	AT^SICI?
<b>Function</b>	Queries the status of the defined connection profile.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: [&lt;CR&gt;&lt;LF&gt;^SICI: &lt;conProfileId&gt;,&lt;conState&gt;,&lt;numServices&gt;,&lt;conAddr&gt; [&lt;CR&gt;&lt;LF&gt;...]]&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<conState >: numeric parameter, which indicates the status of the internet connection profile.

- 0: Down state, which indicates that the internet connection is defined but not established.
- 1: connected state, which indicates that the service is enabled and the internet connection is initialized. This is not supported currently.
- 2: Up state, which indicates that the Internet connection has been established, and one or more services are being used. When network signals are temporarily

unavailable, the connection is kept in Up state, unless the user or the network disconnects the connection.

- 3: restricted state, which indicates that the internet connection is established but is not covered by a network currently. This is not supported currently.
- 4: disabled state, which indicates that the internet connection is interrupted. This is not supported currently.

<numServices>: numeric parameter, which indicates the IDs of services that use the internet connection profile. Value range: 0–9.

<conAddr>: character type parameter, which indicates the local IP address of the internet connection profile (if no local IP address exists, this parameter is left empty).

### 10.2.3 Displaying the Status of the Specified Connection Profile

<b>Write command</b>	AT^SICI=<conProfiled>
<b>Function</b>	Displays the status of the specified connection profile.
<b>Response</b>	<ul style="list-style-type: none"> <li>• In case of successful execution:  &lt;CR&gt;&lt;LF&gt;^SICI:  &lt;conProfileId&gt;,&lt;conState&gt;,&lt;numService&gt;,&lt;conAddr&gt;&lt;CR&gt;&lt;LF&gt;  &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li> <li>• In case of an error during command execution:  &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li> <li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;CME ERROR:  &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li> </ul>

### 10.2.4 Examples

Example 1:

Query the ID of the supported connection profile.

AT^SICI=?

^SICI: (0,1)

OK

Example 2:

Query the information about the current connection profile.

AT^SICI?

^SICI: 0,2,1,192.168.50.100

OK

Example 3:



Display the information about the connection profile whose value of **conProfileId** is **0**.

AT^SICI=0

^SICI: 0,2,1,192.168.50.100

OK

## 10.3 AT^SISS - Command for Creating the Service Profile

The **AT^SISS** command sets the service profile.

### 10.3.1 Checking Whether This Command Is Available

Test command	AT^SISS=?
Function	Checks whether the <b>AT^SISS</b> command is supported.
Response	<ul style="list-style-type: none"><li>• In case of available command: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of unavailable command: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li></ul>

### 10.3.2 Reading the Status of the Service Profile

Read command	AT^SISS?
Function	Reads the status of the defined service profile.
Response	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;^SISS: &lt;srvProfileId&gt;,&lt;srvParmTag&gt;,&lt;srvParmValue&gt; &lt;CR&gt;&lt;LF&gt;^SISS: &lt;srvProfileId&gt;,&lt;srvParmTag&gt;,&lt;srvParmValue&gt; &lt;CR&gt;&lt;LF&gt;...&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<srvProfileId>: numeric parameter, which identifies the service profile. Value range: 0–9.

<srvParmTag>: string parameter. Currently, only the socket service is supported. The following table lists the values of **<srvParmTag>**.

**Table 10-2** Values of <srvParmTag>

<srvParmTag>	Mandatory/Optional
"srvType"	Mandatory
"conId"	Mandatory
"alphabet"(which is not supported currently)	Optional
"address"	Mandatory
"tcpMR"	Optional
"tcpOT"	Optional

<srvParmValue>: value range of the parameter defined by <srvParmTag>. For details, see the following table.

**Table 10-3** Value range of <srvParmValue> and <srvParmTag>

<srvParmTag>	<srvParmValue>
"srvType": service type	<ul style="list-style-type: none"> <li>• Socket</li> <li>• Ftp (not supported currently)</li> <li>• Http (not supported currently)</li> <li>• Smtip (not supported currently)</li> <li>• Pop3 (not supported currently)</li> <li>• none</li> </ul>
"conId": used internet connection profile	Corresponds to <conProfileId>. Value range: 0–5.
"alphabet": selects the settings for input and output character parameters in the profile. The selected values are related to specific profiles. Different profiles have different alphabets. The alphabet is changeable regardless of the value of "srvType" in <srvParmTag>. (which is not supported currently)	<ul style="list-style-type: none"> <li>• "0": character settings depend on "AT+CSCS". Default value.</li> <li>• "1": international reference alphabet (IRA, 7-bit ASCII)</li> </ul>
"address": character value, which depends on the URL under Socket.	<ul style="list-style-type: none"> <li>• URL of TCP client of Socket type "socktcp://host:remote tcpPort"</li> <li>• URL of TCP server of Socket type "socktcp://listener:local tcpPort"</li> <li>• URL of UDP client of Socket type "sockudp://host:remote udpPort"</li> </ul>
"tcpMR": integer, which indicates the maximum number of retransmissions (MR).	Value range: 1–30; default value: 10.

<srvParmTag>	<srvParmValue>
"tcpOT": integer, which indicates the duration (in seconds) to be waited for disabling a link when a TCP/IP data packet is not acknowledged.	Value range: 1–6000; default value: <b>6000</b> .

### 10.3.3 Setting the Internet Service Profile

**Write command** AT^SISS=<srvProfileId>,<srvParmTag><srvParmValue>

**Function** Sets the value of **<csrvParmTag>** for the service profile whose ID is **<srvProfileId>** to **<srvParmValue>**.

**Response**

- In case of successful execution:  
<CR><LF><CR><LF>OK<CR><LF>
- In case of an error during command execution:  
<CR><LF>ERROR<CR><LF>
- In case of an error related to the MT: <CR><LF>CME ERROR:  
<err><CR><LF>

**Note:**

You need to select the internet service type through the "srvType" value of <srvParmTag> before setting other values of <srvParmTag> because the value of "srvType" determines the applicability of other values (excluding the <srvParmValue-alphabet>) of <srvParmTag>. The <srvParmValue-alphabet> parameter can be set either before or after "srvType". The settings for all parameters of the profile are changeable.

### 10.3.4 Examples

Example 1:

Set **srvType** of the service profile whose **ID** is **0** to **Socket**.

AT^SISS=0,srvType, Socket

OK

AT^SISS=0,conId,0

OK

AT^SISS=0,address,"socket://listener:8000"

OK

Example 2:



Query the status of the service profile.

AT^SISS?

^SISS: 0,"srvType","Socket"

^SISS: 0,"conId","0"

^SISS: 0,"alphabet","0"

^SISS: 0,"address","socktcp://listener:8000"

^SISS: 0,"tcpMR","10"

^SISS: 0,"tcpOT","6000"

^SISS: 1,"srvType",""

^SISS: 2,"srvType",""

^SISS: 3,"srvType",""

^SISS: 4,"srvType",""

^SISS: 5,"srvType",""

^SISS: 6,"srvType",""

^SISS: 7,"srvType",""

^SISS: 8,"srvType",""

^SISS: 9,"srvType",""

OK

## 10.4 AT^SISI - Command for Querying the Service Profile

The **AT^SISI** command queries the status of the service profile.

### 10.4.1 Querying the ID of the Defined Service Profile

<b>Test command</b>	AT^SISI=?
<b>Function</b>	Queries the ID of the defined service profile.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: [&lt;CR&gt;&lt;LF&gt;^SISI: (list of defined &lt;srvProfileId&gt;s)&lt;CR&gt;&lt;LF&gt;] &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Parameter description**

<srvProfileId>: numeric parameter, which indicates the identification of the service profile. Value range: 0–9.

## 10.4.2 Querying the Status of the Service Profile

**Read command**      AT^SISI?

**Function**      Queries the status of the defined service profile.

**Response**

- In case of successful execution:  
[<CR><LF>^SISI:  
<srvProfileId>,<srvState>,<rxCount>,<txCount>,<ackData>,<unackData>  
<a>  
[<CR><LF>^SISI: ...]] <CR><LF>  
<CR><LF>OK<CR><LF>
- In case of an error during command execution:  
<CR><LF>ERROR<CR><LF>
- In case of an error related to the MT: <CR><LF>CME ERROR:  
<err><CR><LF>

**Parameter description**

< srvState >: numeric parameter, which indicates the status of the internet service profile.

- 2: allocated
- 3: connecting (which is not supported currently)
- 4: up
- 5: closing (The module goes into this state only when the other terminal of the connection disconnects the connection and local data has not been read.)
- 6: down (which is not supported currently)

<rxCount>: numeric parameter, which indicates the number of bits received by **AT^SISR** after the link is successfully established.

<txCount>: numeric parameter, which indicates the number of bits sent by **AT^SISW** after the link is successfully established.

<ackData>: numeric parameter, which indicates the number of data bytes that have been sent and acknowledged by the TCP layer.

<unackData>: numeric parameter, which indicates the number of data bytes that have been sent but have not been acknowledged by the TCP layer. When the value of this parameter is **0**, it indicates that the data has been fully sent and acknowledged.



## 10.4.3 Displaying the Status of the Specified Service Profile

<b>Write command</b>	AT^SISI=<srvProfileId>
<b>Function</b>	Queries the information about a service profile.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;^SISI:&lt;srvProfileId&gt;,&lt;srvState&gt;,&lt;rxCount&gt;,&lt;txCount&gt;,&lt;ackData&gt;,&lt;unackData&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li></ul> In case of an error related to the MT: <CR><LF>CME ERROR: <err><CR><LF>

## 10.4.4 Examples

Example 1:

Query the value of **srvProfileId** for the defined profile.

AT^SISI=?

^SISI: (0,1,2)

OK

Example 2:

Query the information about all defined service profiles.

AT^SISI?

^SISI: 0,3,0,0,0,0

^SISI: 1,4,10,0,0,0

^SISI: 1,4,0,10,0,0

OK

Example 3:

Query the information about the service profile whose value of **srvProfileId** is 1.

AT^SISI=1

^SISI: 1,4,10,0,0,0

OK



## 10.5 AT^SISO - Command for Starting Internet Services

This command starts a specified Internet service.

### 10.5.1 Checking Whether This Command Is Available

<b>Test command</b>	AT^SISO=?
<b>Function</b>	Returns the result of whether this command is available.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### 10.5.2 Querying the Open Status of All Services

<b>Read command</b>	AT^SISO?
<b>Function</b>	Reads the open status of all services.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;^SISO: &lt;srvProfileId&gt;,&lt;srvType&gt;,&lt;srvState&gt;,&lt;socketState&gt;,&lt;rxCount&gt;,&lt;txCount&gt;,&lt;locAddr&gt;,&lt;remAddr&gt; [&lt;CR&gt;&lt;LF&gt;^SISO: ...]] &lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<srvProfileId>: numeric parameter, which indicates the ID of the internet service profile. 0–9

<srvType>: service type

- Socket
- Ftp (not supported currently)
- Http (not supported currently)
- Smtip (not supported currently)
- Pop3 (not supported currently)
- none

< srvState >: numeric parameter, which indicates the status of internet services.

- 2: allocated
- 3: connecting (not supported temporarily)
- 4: up
- 5: closing (not supported temporarily)
- 6: down (not supported temporarily)

<socketstate>: identification of socket status.

- 1: No socket is allocated.
- 2: client socket
- 3: listener socket
- 4: server socket

<rxCount>: numeric parameter, which indicates the number of bits received by **AT^SISR** after the link is successfully established.

<txCount>: numeric parameter, which indicates the number of bits sent by **AT^SISW** after the link is successfully established.

<locAddr>: local IP address and TCP port that are used recently.

<remAddr>: remote IP address and TCP port.

### 10.5.3 Starting a Specified Internet Service

<b>Write command</b>	AT^SISO=<srvProfileId>
<b>Function</b>	Starts an internet service.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

- 2G network does not support concurrent voice calls and data services. Therefore, "ERROR" will be returned if this command is run during a call.
- A maximum of eight services can be active at the same time.

### 10.5.4 Examples

Example 1:

Enable service 0.

AT^SISO=0

OK

Example 2:

Query the enabling status of all services.

AT^SISO?

^SISO: 0,Socket,3,3,0,0,192.168.50.25:8000,0.0.0.0

OK

## 10.6 AT^SISC - Command for Stopping Internet Services

This command stops a specified Internet service.

### 10.6.1 Checking Whether This Command Is Available

<b>Test command</b>	AT^SISC=?
<b>Function</b>	Checks whether this command is available.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### 10.6.2 Stopping a Specified Internet Service

<b>Write command</b>	AT^SISC=<svrProfileId>
<b>Function</b>	Stops the service whose ID is <svrProfileId>.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<svrProfileId>: numeric parameter, which indicates the identification of the internet service profile. Value range: 0–9.

### 10.6.3 Examples

Example 1:

Stop the internet service whose ID is **0**.

AT^SISC=0

OK

## 10.7 AT^SISW - Command for Writing Data for Internet Services

The **AT^SISW** command uploads data to the upper layer from the internal buffer or queries the number of data bytes that have been sent but have not been acknowledged by the TCP layer. The unsolicited reporting command notifies the upper layer that the data can be written.

### 10.7.1 Checking Whether This Command Is Available

<b>Test command</b>	AT^SISW=?
<b>Function</b>	Checks whether this command is available.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of available command: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### 10.7.2 Writing Data to the Buffer of a Service

<b>Write command</b>	AT^SISW=<srvProfileId>,<reqWriteLength>[,<eodFlag>[,<mode>]]
<b>Function</b>	Writes data to the buffer of a service.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;^SISW: &lt; srvProfileId &gt;,&lt;reqWriteLength&gt;[,&lt;unackData&gt;] &lt;CR&gt;&lt;LF&gt;(Enter the data to be written but the data is not displayed.)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<srvProfileId>: numeric parameter, which indicates the identification of the internet service profile. Value range: 0–9.

<reqWriteLength>: integer parameter, which specifies the length of data bytes to be written by **^SISW**. Value range: 0–1500.

When the value is **0**, if the TCP protocol is used, you can query the **<unackdata>** parameter that is not acknowledged by the TCP layer; if the UDP protocol is used, it indicates that an empty UDP packet is sent.

If the socket service uses the UDP protocol, it is recommended that each UDP packet limits 1460 bytes of data, otherwise the unsolicitedly report "**^SIS: < srvProfileId >, 0, 9, The supplied buffer was too small / large**" may occur.

<eodFlag>: flag of data tail identification. (Not supported currently)

- 0 (default value): No data tail exists and other data is sent directly.
- 1: data tail.

<mode>: controls the mode of sending data (not supported currently).

- 0 (default value): binary mode
- 1: interactive text mode

<cnfWritetLength>: integer parameter, which confirms the number of data bytes to be sent in the internet service whose ID is **<srvProfileId>**. Currently, **<cnfWritetLength>** is equivalent to **<reqWriteLength>**. Value range: 0–1500.

<unackData>: number of data bytes that have been sent but have not been acknowledged by the TCP layer.

### 10.7.3 ^SISW - Command for Reporting Unsolicitedly

**URC** <CR><LF>^SISW:<srvProfileId><urcCauseId>[,<unackData>]<CR><LF>

**Function** The **^SISR** command (command for unsolicitedly reporting data) notifies the upper layer that the service is established and data can be written.

**Note:**

When a non-monitored Internet service is successfully enabled, ^SISW is reported.

#### Parameter description

<urcCauseId>: integer parameter.

1: The service is ready for receiving new user data.

### 10.7.4 Examples

Example 1:

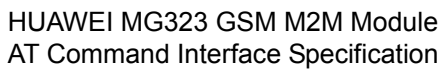
Check whether the command is available.

AT^SISW=?

OK

Example 2:





OK

The **AT^SISR** command reads data out from the service buffer.

### 10.8.1 Checking Whether the AT^SISR Command Is Available

<b>Test command</b>	AT^SISR=?
<b>Function</b>	Checks whether this command is available.
<b>Response</b>	<ul style="list-style-type: none"> <li>• In case of available command: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li> <li>• In case of unavailable command: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li> <li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li> </ul>

## 10.8.2 Reading Data Out From the Buffer of an Internet Service

**Write command** AT^SISR=<srvProfileId>,<reqReadLength>

**Function** Reads data out from the buffer of an internet service.

**Response**

- In case of successful execution:
- When the buffer contains data:  
<CR><LF>^SISR:  
<srvProfileId>,<reqReadLength>[,<remainUdpPacketLength>]  
<CR><LF>.....(Returns the read data)<CR><LF>  
<CR><LF>OK<CR><LF>
- When the buffer contains no data or the length of the read data is 0:  
<CR><LF>^SISR:  
<srvProfileId>,<reqReadLength>[,<remainUdpPacketLength>]<CR><LF>  
>  
<CR><LF>OK<CR><LF>
- In case of an error during command execution:  
<CR><LF>ERROR<CR><LF>
- In case of an error related to the MT: <CR><LF>CME ERROR:  
<err><CR><LF>

**Note:**

The buffer for the SISR command can store a maximum of 1500 bytes of data. If a UDP packet contains more than 1500 bytes of data, the extra part will be discarded.

### Parameter description

<srvProfileId>: integer parameter, which indicates the identification of the internet service profile. Value range: 0–9.

<reqReadLength>: integer parameter, which indicates the data length requested from the buffer.

- 0: Peek Operator, which queries the number of bytes received by the internal buffer.
- 1–1500: number of data bytes read by the internet service whose **<srvProfileId>** is specified.
- -2: indicates the data tail. The data is fully transmitted. This value is not supported currently.
- -1 (applies to HTTP only): queries the number of available bytes not supported by the HTTP service. This value is not supported currently.
- 0: indicates that no data is available currently.
- >0: number of available data bytes. The value range is defined by **<reqReadLength>**.

<remainUdpPacketLength>: Integer parameter, which is used when Socket service is UDP protocol.

- 0: indicates all the bytes that are being read from the current UDP data packet.
- 1...(max.data size)-1: indicates that the current UDP data packet has not been completely read. The displayed value indicates the number of the remaining bytes.

### 10.8.3 ^SISR - Command for Reporting Unsolicitedly

**URC** <CR><LF>^SISR: <srvProfileId>,<urcCauseId><CR><LF>

**Function** The **^SISR** command (command for unsolicitedly reporting data) notifies the upper layer that certain data can be read.

**URC** <CR><LF>^SISR: 80 percent of the receiving buffer has been full<CR><LF>

**Function** The **^SISR** command (command for unsolicitedly reporting data) notifies the upper layer that 80 percent of the receiving buffer has been used.

**URC** <CR><LF>^SISR: the receiving buffer has been full<CR><LF>

**Function** **^SISR** command (command for unsolicitedly reporting data) notifies the upper layer that all the receiving buffer has been used.

**Note:**

If the buffer is not read or queried by the ^SISR command when data is available, no report will be submitted to the upper layer when new data arrives.

#### Parameter description

<urcCauseId>: indicates whether there is data to be read.

- 1: indicates that data is available and can be read by sending the AT^SISR command.
- 2: indicates that the data transmission has ended (this setting is not supported currently).

### 10.8.4 Exmaples

Example:

Read data from the service buffer.

Precondition: The data service connection has been established and successfully enabled; there is data in the buffer.

AT^SISR=1,25

^SISR: 1,25

Message of MG323 is here.

OK

## 10.9 ^SIS - Command for Unsolicitedly Reporting the Information About Internet Services

The **^SIS** command (URC command) unsolicitedly reports the information about internet services. Currently, the URC cannot be disabled.

**URC**     <CR><LF>^SIS: <srvProfileId>,<urcCause>[,  
          [<urcInfold>][,<urcInfoText>]]<CR><LF>

**Note:**

- This response is unsolicitedly reported, which is set through the AT^SCFG command.
- When the server receives the socket connection of the client, the <urcInfold> parameter in the ^SIS unsolicited reporting indicates the profileid of the service that is automatically created by the server.

### Parameter description

<urcCause>: identification of URC cause.

- 0: indicates an event that occurs when an internet service is enabled or being used. The event may be error, warning, information element, or note.
- 1: indicates that the service whose Socket listening is enabled is receiving the connection request sent by the remote client.
- 2: indicates the failure of connecting the introduced Socket service client. Since no available internet service profile exists, the request sent by the client is rejected.

<urcInfold>: identification of information about **<urcCause>**.

- 0: The service works properly.
- 1–2000: Error; the service is interrupted; enter **<srvState>=6(Down)**.
- 2001–4000: information about service processing
- 4001–6000: Warning; the service is not interrupted.
- 6001–8000: Notes

<urcInfoText>: information about **<urcCause>**.



**NOTE**

When the value of **urcCause** is **1**, **urcInfold** actually indicates the profile ID that is dynamically assigned by the listener to the client request.

# 11

## Commands for Short Messages

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This chapter describes the AT commands related to short messages. Currently, the MG323 does not support short messages in text mode.

### 11.1 AT+CMGD - Command for Deleting Short Messages

The **AT+CMGD** command deletes the short messages that are stored on the preferred memory<mem1> (for details, see AT+CPMS).

#### 11.1.1 Checking the Parameter Range Supported by the Command

<b>Test command</b>	AT+CMGD=?
<b>Function</b>	Checks the supported indexes of short messages and deletes the parameters of short message type.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CMGD: (list of supported &lt;index&gt;s),(list of supported &lt;delflag&gt;s)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>



## 11.1.2 Deleting Short Messages

<b>Write command</b>	AT++CMGD=<index>[,<delflag>]
<b>Function</b>	Deletes the short messages that are stored on the storage media.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

When the value of the <delflag> parameter is not 0, the first parameter <index> can be ignored and executed according to the <delflag> parameter.

### Parameter description

<index>: numeric, which indicates the location for storing short messages. The value range is related to the storage media. The storage media is set by **+CPMS**. Currently, only SM is supported.

< delflag >: numeric, which specifies the short messages to be deleted.

- 0 (default value): deletes the short messages that are specified by **<index>**.
- 1: deletes all the read short messages that are stored on the preferred memory <mem1>, and retains the unread short messages, sent short messages, and unsent short messages.
- 2: deletes all the read short messages and sent short messages that are stored on the preferred memory <mem1>, and retains the unread short messages and unsent short messages.
- 3: deletes all the read short messages, sent short messages, and unsent short messages that are stored on the preferred memory <mem1>, and retains the unread short messages.
- 4: deletes all the short messages that are stored on the preferred memory <mem1>, including the unread short messages.

## 11.1.3 Examples

Example:

AT+CMGD=?

+CMGD:(1-255), (0-4)

OK

Check the parameter range.

AT+CMGD=1

OK

Delete the first short message.

AT+CMGD=1, 4



OK  
stored on the SIM card.

Delete all the short messages that are

## 11.2 AT+CMGF - Command for Setting the Format of Short Messages

The **AT+CMGF** command sets the format of short messages for the device. The format follows two modes, that is, the PDU mode and text mode (reserved; not supported currently), which are determined by the **<mode>** parameter. For details about the format of short messages in PDU mode, see the **AT+CMGS** Command.

### 11.2.1 Checking the Supported Format of Short Messages

<b>Test command</b>	AT+CMGF=?
<b>Function</b>	Checks the supported format of short messages.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CMGF: (list of supported &lt;mode&gt;s)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<mode>: numeric, which indicates the format of short messages.

- 0 (default value): PDU mode
- 1 text mode (not supported currently)

## 11.2.2 Reading the Format of Short Messages

<b>Read command</b>	AT+CMGF?
<b>Function</b>	Reads the current format of short messages.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CMGF: &lt;mode&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

## 11.2.3 Setting the Format of Short Messages

<b>Write command</b>	AT+CMGF=<mode>
<b>Function</b>	Sets the format of short messages.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

If no parameters of this command are set, AT+CMGF= considers the previously set values valid for various parameters.

## 11.2.4 Examples

Example 1:

Set the format of short messages.

AT+CMGF=0

OK

Example 2:

Query the format of short messages.

AT+CMGF?

+CMGF: 0

OK





## 11.3 AT+CMGL - Command for Querying the List of Short Messages

The **AT+CMGL** command queries the list of short messages that are stored on the preferred memory <mem1>.

### 11.3.1 Checking the Supported Status of Short Messages

<b>Test command</b>	AT+CMGL=?
<b>Function</b>	Returns the status of short messages supported by this command.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CMGL: (list of supported &lt;stat&gt;s)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<stat>: string, which indicates the status of short messages. The status is classified into two types.

1. AT+CMGF=1, that is, when short messages are in Text mode (not supported currently).

Value	Description
REC UNREAD	Unread short messages that are received
REC READ	Read short messages that are received
STO UNSENT	Unsent short messages that are stored
STO SENT	Sent short messages that are stored
ALL	All short messages

2. AT+CMGF=0, that is, when short messages are in PDU mode.

Value	Description
0	Unread short messages that are received
1	Read short messages that are received
2	Unsent short messages that are stored
3	Sent short messages that are stored

Value	Description
4	All short messages

## 11.3.2 Reading the List of Short Messages

**Write command** AT+CMGL[=<stat>]

**Function** Reads the list of short messages whose status is <stat>.

**Response**

- When short messages are in PDU mode (**+CMGF=0**) and the command is successfully executed:
- [<CR><LF>+CMGL:  
<index>,<stat>,<reserved>,<length><CR><LF><pdu><CR><LF>  
>  
[<CR><LF>+CMGL:<index>,<stat>,<reserved>,<length><CR><LF><pdu>[...]]<CR><LF>  
<CR><LF>OK<CR><LF>
- In case of an error: <CR><LF>ERROR<CR><LF>
- In case of an error related to the MS: <CR><LF>+CMS ERROR:  
<err><CR><LF>

**Note:**

If no parameters of this command are set, AT+CMGL is equivalent to AT+CMGL=0.

### Parameter description

**Table 11-1** Structure of <pdu>

[<SCA>]			
<sc_len>	<type_addr>	<numbers>	TPDU

In the preceding table, for the <SCA>, <sc\_len>, <type\_addr>, and <numbers> fields, see the AT+CMGS Command.

For a sent short message, the data structure of TPDU has the same definition as that described in the section AT+CMGS Command. For a received short message, the data structure of TPDU is as follows:

**Table 11-2** Data structure of TPDU

1 Oct							2 Oct to 12 Oct	1 Oct	1 Oct	7 Oct	1Oct	
TP-MTI	MMS	0	0	SRI	UDHI	RP	OA	PID	DCS	SCTS	UDL	UD
Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7					

### 11.3.3 Examples

Example 1:

In PDU mode, run the **AT+CMGL** command to list all short messages.

AT+CMGL=4

+CMGL: 1,1, , 160

...(Short messages in PDU mode)

OK

## 11.4 AT+CMGR - Command for Reading Short Messages

This command returns the short messages whose storage location is **index** from preferred memory **<mem1>**. If the status of short messages is "Unread short messages that are received", after the command is successfully executed, the status of short messages on the memory is changed to "Read short messages that are received".

### 11.4.1 Testing Whether the Command for Reading Short Messages Is Supported

<b>Test command</b>	AT+CMGR=?
<b>Function</b>	Checks whether the command for reading short messages is supported.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

## 11.4.2 Reading Short Messages

<b>Write command</b>	AT+CMGR=<index>
<b>Function</b>	Reads the short messages whose storage location is <b>index</b> from the preferred memory <mem1>.
<b>Response</b>	<ul style="list-style-type: none"><li>• When short messages are in PDU mode (<b>+CMGR=0</b>) and the command is successfully executed: [&lt;CR&gt;&lt;LF&gt;+CMGR: &lt;stat&gt;,[&lt;alpha&gt;],&lt;length&gt;&lt;CR&gt;&lt;LF&gt;&lt;pdu&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS during command execution: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li><li>• When the index of the location to be read exceeds the maximum index of the SIM card: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<index>: integer, indicates the storage position of the short message in the memory.

<length>: integer, indicates the number of bytes in the TPDU.

<stat>: message type.

For messages in PDU mode (AT+CMGF=0):

- 0: indicates messages that have been received but not read.
- 1: indicates messages that have been received and read.
- 2: indicates messages that have been stored but not sent.
- 3: indicates messages that have been sent and stored

<alpha>: not supported currently

<pdu>: PDU. For details, see the **AT+CMGL** command.

Example 1:

Run **AT+CMGR** to read short messages.

Run **AT+CMGR=1** to read the short message whose storage location is 1.

+CMGL: 1,,160

...(Short messages in PDU mode)

OK

## 11.5 AT+CMGS - Command for Sending Short Messages

The **AT+CMGS** command sends short messages in two steps:

In PDU mode (**AT+CMGF=0**):

First, send **+CMGS=<length>** that ends with (CR).

Then, upon receiving > that is returned by the MT, the TE sends a PDU data packet that ends with <ctrl-Z>(IRA 26).

### 11.5.1 Testing Whether the Command for Sending Short Messages Exists

<b>Test command</b>	AT+CMGS=?
<b>Function</b>	Tests whether the command for sending short messages exists.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### 11.5.2 Sending Short Messages

This command sends short messages in PDU mode (**+CMGF=0**).

<b>Write command</b>	AT+CMGS=<length><CR>PDU is given <Ctrl-Z/Esc>
<b>Function</b>	Sends short messages.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CMGS: &lt;mr&gt;[,&lt;ackpdu&gt;] &lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<mr>: identifier of short messages, which is a decimal number consisting of digits 0–9. Value range: 0–65535. For details, see 3GPP TS 23.040[3] TP-Message-Reference integer format.

<length>: number of characters of the actually sent TPDU / 2; a decimal number consisting of digits 0–9; GSM 7-bit coding; the maximum length is 160 characters; for Chinese characters in UCS2 coding, the maximum length is 70 characters; otherwise, ERROR is returned.



<ackpdu>: When the value of **<service>** in **+CSMS** is **1** and the network support is provided, this field is returned. Except for the lack of SCA, this field has the same format as PDU. (Not supported currently)

<Ctrl-Z>: indicates the end of a short message. The character is '0x1A'.

<Esc>: cancels the sending of the current short message. The character is '0x1B'.

### 11.5.3 Examples

Example:

Send short messages in PDU mode (**+CMGF=0**).

AT+CGSMS=1

OK

AT+CMGF=0

OK

AT+CNMI=1,2,0,0,0

OK

AT+CMGS=20

>07813108608805F911000B813109732008F70000FF06E8329BFD0E01 Contents  
of short messages Ctrl-Z

+CMGS: 19

OK

## 11.6 AT+CMGW - Command for Storing Short Messages

The **AT+CMGW** command stores a short message to the **<mem2>** memory that is set by the **+CPMS** command. Currently, **<mem2>** supports only SM.

### 11.6.1 Checking Whether the Command for Storing Short Messages Is Supported

Test command	AT+CMGW=?
Function	Checks whether this command is supported.
Response	<ul style="list-style-type: none"><li>• In case of available command: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of unavailable command: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

## 11.6.2 Storing Short Messages

This command stores short messages in PDU mode (**+CMGF=0**).

<b>Write command</b>	AT+CMGW=<length>[,<stat>]<CR>PDU is given <ctrl-Z/ESC>
<b>Function</b>	Stores short messages in PDU mode.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CMGW: &lt;index&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<stat>: storage status of short messages.

<length>: number of characters of the actually sent TPDU / 2.

<index>: location number in the memory; a decimal number consisting of digits 0–9; value range: 0–(maximum capacity of the memory - 1).

<ctrl-Z>: indicates the end of an entry of PDU data. The character is '0x1A'.

<ESC>: cancels the sending of the current short message. The character is '0x1B'.

## 11.6.3 Examples

Example:

Store a short message in PDU mode.

AT+CMGF=0

AT+CMGW=56

>07813108608805F911000B813109732008F70000FF30547419347EBBE965371DF  
13683DAE5F93C7C2E83EE693A1A0427D741ED37B90C3ABFCB7310BA2C2F834  
2<Ctrl-Z>

+CMGW: 10

OK

## 11.7 AT+CMSS - Command for Selecting a Short Message from the Memory and Sending It

The **AT+CMSS** command sends a short message at the specified index location.

## 11.7.1 Checking Whether the Command for Sending Short Messages Is Available

Test command	AT+CMSS=?
Function	Checks whether the <b>AT+CMSS</b> command is available.
Response	<ul style="list-style-type: none"><li>• In case of available command: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of unavailable command: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

## 11.7.2 Sending a Short Message at the Specified Location

Write command	AT+CMSS=<index>[,<da>[,<tda>]]
Function	Sends a short message at the specified index location.
Response	<ul style="list-style-type: none"><li>• When the short message is in PDU mode (<b>+CMGF=0</b>) and the short message is successfully sent: &lt;CR&gt;&lt;LF&gt;+CMSS: &lt;mr&gt;[,&lt;ackpdu&gt;]&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<index>: location of short messages on the SIM card.

<da>: number of the short message receiver. Value range: 0–9, +, \*, and #. This parameter consists of not more than 20 characters. “+” must be the first character.

<tda>: a 1-byte number, which indicates the address coding mode. This parameter takes effect only when the address code has eight bits. The default value is 0.

The four most significant bits indicate the number type:

- 0: UNKNOWN
- 1: INTERNATIONAL

The four least significant bits indicate the number plan:

- 0: UNKNOWN
- 1: TELEPHONY

<mr>: identifier of short messages, which is a decimal number consisting of digits 0–9. Value range: 0–255.





<ackpdu>: When the value of <service> in **AT+CSMS** is **1** and network support is provided, this field is returned. Except for the lack of SCA, this field has the same format as PDU. (Not supported currently)

### 11.7.3 Examples

Example:

Send a stored short message in PDU mode.

AT+CMGF=0

OK

AT+CMSS=8

A short message whose status is **2** exists at the

location whose index is **8**

+CMSS: 21

OK

## 11.8 AT+CNMI - Command for Setting the Notification for a New Short Message

The **AT+CNMI** command sets the notification that is used to report the received new short message to the TE.

### 11.8.1 Checking the Parameter Range Supported by the AT+CNMI Command

<b>Test command</b>	AT+CNMI=?
<b>Function</b>	Queries the parameters supported by the <b>CNMI</b> command.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CNMI: (list of supported &lt;mode&gt;s),(list of supported &lt;mt&gt;s),(list of supported &lt;bm&gt;s),(list of supported &lt;ds&gt;s),(list of supported &lt;bfr&gt;s) &lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<mode>: integer, which sets the short message notification mode.

- 0 (default value): buffers the short message notification on the ME. If the buffer of the ME is full, the new notification overwrites the oldest one.
- 1: sends the short message notification directly to the TE. When the notification fails to be sent (for example, in online data mode), the notification is discarded.
- 2: sends the short message notification and the short message status report directly to the TE. When the notification fails to be sent (for example, in online data mode), the notification is buffered on the ME. When the buffered notification can be sent, it is sent to the TE at a time.

<mt>: integer, which sets the rules for storing and notifying the received short messages.

- 0 (default value): No SMS-DELIVER indications are sent to the TE.
- Three methods of storing and notifying new short messages are as follows:
- 1: stores the SMS-DELIVER on the MT and sends a storage location notification to the TE. +CMTI: <mem>,<index>
- 2: does not store the SMS-DELIVER on the MT and sends the SMS-DELIVERS directly to the TE.

PDU mode: +CMT: [<reserved>],<length><CR><LF><pdu>

- 3: stores the SMS-DELIVER on the MT and does not send the SMS-DELIVER notification to the TE (not supported currently).

<bm>: integer, which sets the rules for storing and notifying the received cell broadcast messages (CBMs).

- 0: No CBM is reported to the TE (default value).
- 2: New CBMs are sent directly to the TE through unsolicited reporting:

PDU mode: +CBM: <length><CR><LF><pdu>

<ds>: integer, which sets the return receipt of short messages.

- 0: does not send the return receipt of short messages to the TE.
- 1: does not store the return receipt of short messages on the MT and sends it directly to the TE.

PDU mode: +CDS: <length><CR><LF><pdu>

<bfr>: integer, which sets the buffer processing mode when the <mode>=0 mode is changed to the <mode>=1-2 mode.

- 0: sends the buffered URCs to the TE at a time when the <mode>=0 mode is changed to the <mode>=1-2 mode (default value).
- 1: clears the buffered URCs when the <mode>=0 mode is changed to the <mode>=1-2 mode.

## 11.8.2 Reading the Status of Short Message Notification

<b>Read command</b>	AT+CNMI?
<b>Function</b>	Reads the status of CNMI.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CNMI: &lt;mode&gt;,&lt;mt&gt;,&lt;bm&gt;,&lt;ds&gt;,&lt;bfr&gt;&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

## 11.8.3 Setting the Status of Short Message Notification

<b>Write command</b>	AT+CNMI=[<mode>,<mt>,<bm>,<ds>,<bfr>]]]]]
<b>Function</b>	Sets the status of short message notification.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

- After the MT restarts, the setting values of this command are cleared. In this case, no new short message is reported. It is not recommended that the setting mode of AT+CNMI=0,0,0,0,0 be used.
- The <mode> and <bfr> parameters set the mode of reporting the new short message notification to the TE.
- The <mt> parameter sets whether to report a new short message directly to the TE or stores it on the MT and reports the storage location to the TE when receiving the new short message.
- The <bm> parameter sets whether to report a new CBM directly to the TE or stores it on the MT and reports the storage location to the TE when receiving the new CBM. The <ds> parameter sets whether to report the short message status report (+CDS).

## 11.8.4 Examples

**Example 1:**

Set the short message notification mode as follows: store the short message and send the storage location to the TE; do not send the short message status report.

AT+CNMI=1,1,0,0,0

OK

Example 2:

Set the short message notification mode as follows: do not store the short message and send it directly to the TE; do not send the short message status report.

AT+CNMI=1,2,0,0,0

OK

Example 3:

Set the short message notification mode as follows: store the short message on the MT and report the storage location to the TE; do not store the short message status report and report it directly.

AT+CNMI=1,1,0,1,0

OK

Example 4:

Set the short message notification mode as follows: store the short message on the MS and report the storage location to the TE; store the short message status report on the MS and report the storage location to the TE; if the short message status report fails to be reported, the status report is discarded.

AT+CNMI=1,1,0,2,0

OK

## 11.9 AT+CPMS - Command for Setting the Storage Location of Short Messages

The **AT+CPMS** command sets the storage location of short messages.

### 11.9.1 Checking the Storage Location of Short Messages

<b>Test command</b>	AT+CPMS=?
<b>Function</b>	Checks the available storage location of short messages.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CPMS: (list of supported &lt;mem1&gt;s),(list of supported &lt;mem2&gt;s),(list of supported &lt;mem3&gt;s)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Parameter description:**

<mem1>: string value, the preferred memory, which indicates the media on which the operations of reading and deleting short messages are performed. Only "SM" that indicates the SIM card is supported. It is saved upon power failure.

<mem2>: string value, which indicates the media on which the operations of writing and sending short messages are performed. Value options of <mem2> are the same as those of <mem1>. It is saved upon power failure.

<mem3>: string value, which indicates the media on which the operations of receiving short messages are performed. Value options of <mem3> are the same as those of <mem1>. It is saved upon power failure.

<total1>: integer value, which indicates the capacity of <mem1> for storing short messages.

<total2>: integer value, which indicates the capacity of <mem2> for storing short messages.

<total3>: integer value, which indicates the capacity of <mem3> for storing short messages.

<used1>: integer value, which indicates the number of existing short messages in <mem1>.

<used2>: integer value, which indicates the number of existing short messages in <mem2>.

<used3>: integer value, which indicates the number of existing short messages in <mem3>.

## 11.9.2 Reading the Status of Storage Location

<b>Read command</b>	AT+CPMS?
<b>Function</b>	Reads the current status of storage location.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CPMS: &lt;mem1&gt;,&lt;used1&gt;,&lt;total1&gt;,&lt;mem2&gt;,&lt;used2&gt;,&lt;total2&gt;,&lt;mem3&gt;,&lt;used3&gt;,&lt;total3&gt;&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### 11.9.3 Setting the Storage Location

<b>Write command</b>	AT+CPMS=<mem1>[,<mem2>[,<mem3>]]
<b>Function</b>	Sets the storage media on which the operations of reading and writing short messages are performed.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CPMS: &lt;used1&gt;,&lt;total1&gt;,&lt;used2&gt;,&lt;total2&gt;,&lt;used3&gt;,&lt;total3&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### 11.9.4 Examples

Example 1:

Read the current status of storage location.

AT+CPMS=?

+CPMS: ("SM"), ("SM"), ("SM")

OK

Example 2:

Check the available storage location of short messages.

AT+CPMS?

+CPMS: "SM",12,20, "SM",12,20, "SM",12,20

OK

Example 3:

Set the first storage location of short message to SM.

AT+CPMS="SM"

+CPMS: 12,20,12,20,12,20

OK

## 11.10 AT+CSCA - Command for Setting the Number of the SMSC

The **AT+CSCA** command sets the number of the SMSC. For short messages in PDU mode, the settings performed through this command are used only when **sc\_len=0**

(the parameter related to the number of the SMSC in the PDU). For details about the PDU format, see the **AT+CMGS** Command.

### 11.10.1 Checking Whether the Command Is Available

<b>Test command</b>	AT+CSCA=?
<b>Function</b>	Checks whether the command is available.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of available command: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of unavailable command: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### 11.10.2 Reading the Currently Registered Number of the SMSC

<b>Read command</b>	AT+CSCA?
<b>Function</b>	Reads the currently registered number of the SMSC.
<b>Response</b>	<ul style="list-style-type: none"><li>• When the SMSC has been registered: &lt;CR&gt;&lt;LF&gt;+CSCA: &lt;sca&gt;,&lt;tosca&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• When the SMSC has not been registered: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

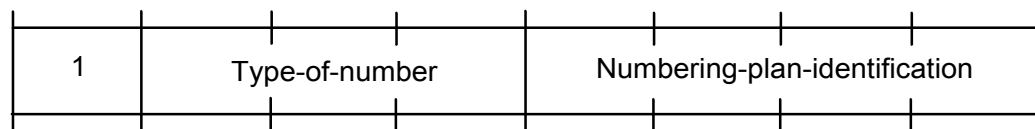
When the number of the SMSC is left empty, the returned value of <sca> is null.

#### Parameter description

<sca>: string, which indicates the number of the SMSC. The number consists of “\*”, “#”, “+”, and “0”–“9”, and contains not more than 20 characters (excluding the “+” symbol) in length. It is saved upon power failure.

<tosca>: numeric, saved upon power failure, which indicates the number type. The value **145** indicates an international number. For detailed values, see the definitions of **type\_addr**.

<type\_addr>: number address type, which consists of two characters. The following figure shows the structure of **<type\_addr>**.



Values of **Type-of-Number** (bit6...bit4) are as follows:

- 0 0 0 This value is filled in when the subscriber does not understand the prior information about the target address number. In this case, the address number is organized by the network.
- 0 0 1 This value is used when the subscriber number is identified as an international number. This value can also be filled in when the subscriber number falls within the number range of the home country.
- 0 1 0 National phone number, to which no prefix or suffix can be added. This value is used when the subscriber sends an national phone number.
- 0 1 1 Special number on the local network, which is used for management or service. The subscriber cannot use this value.
- 1 0 1 Default 7-bit coding mode with the number type being GSM.
- 1 1 0 Short number, which is not used currently.
- 1 1 1 Reserved for extension. This value is not used currently.

Values of **Numbering-plan-identification** (bit3...bit0) are as follows:

(Note: bit3...bit0 is valid only when the value of bit6...bit4 is 000,001,010.)

- 0 0 0 0 The number is determined by the numbering plan on the network.
- 0 0 0 1 ISDN/telephone numbering plan
- 0 0 1 1 Data numbering plan, which is not used currently.
- 0 1 0 0 Telex numbering plan, which is not used currently.
- 1 0 0 0 National numbering plan, which is not used currently.
- 1 0 0 1 Private numbering plan, which is not used currently.
- 1 0 1 0 ERMES numbering plan, which is not used currently.

If the command does not contain the **<tosca>** parameter, it indicates that the **<tosca>** parameter is not modified.

### 11.10.3 Setting the Number of the SMSC

<b>Write command</b>	AT+CSCA=<sca>[,<tosca>]
<b>Function</b>	Sets the number of the SMSC.
<b>Response</b>	<ul style="list-style-type: none"> <li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li> <li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li> <li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li> </ul>





## 11.10.4 Examples

Example 1:

Set the number of the SMSC.

AT+CSCA=1380063859

OK

Example 2:

Query the status of the SMSC.

AT+CSCA?

+CSCA: "1380063859", "129"

OK

## 11.11 AT+CSCB - Command for Selecting the Type of Cell Messages

The **AT+CSCB** command selects the type of cell messages.

### 11.11.1 Checking the Parameter Range Supported by the Command

**Test command** AT+CSCB=?

**Function** Checks the parameter range supported by the command.

**Response**

- In case of successful execution:  
<CR><LF>+CSCB: (list of supported <mode>s) <CR><LF>  
<CR><LF>OK<CR><LF>
- In case of an error during command execution:  
<CR><LF>ERROR<CR><LF>
- In case of an error related to the MT: <CR><LF>+CME ERROR:  
<err><CR><LF>

#### Parameter description

<mode>: numeric, which indicates the message type.

- 0: adds the message type that is defined by <mids><dcss> from the previous settings.
- 1: removes the message type that is defined by <mids><dcss> from the previous settings.

## 11.11.2 Reading the Current CBM Type

<b>Read command</b>	AT+CSCB?
<b>Function</b>	Reads the current CBM type.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CSCB: &lt;mode&gt;,&lt;mids&gt;,&lt;dcss&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<mids>: string, which indicates the combination of all CBM identification codes. This parameter is stored in SIM card. For example, "0,1,5,320-478,922". A maximum of fifteen values are supported

<dcss>: string, which indicates the combination of all CBM data coding schemes. The default value is 0-255. For example, "0-3,5". A maximum of five values are supported

Setting the Current CBM Type

## 11.11.3 Setting the Current CBM Type

<b>Write command</b>	AT++CSCB=[<mode>[,<mids>[,<dcss>]]]
<b>Function</b>	Sets the current CBM type.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Note:

- If no parameters of this command are set, AT+CSCB= considers the previously set values valid for various parameters.
- The settings specified by **mids** and **dcss** are added to or removed from the previous settings.
- **at+cscb=0** deletes all **mids** and **dcss** settings that have been configured.
- **at+cscb=1** keeps **mids** unchanged and sets **dcss** to the default value.

## 11.11.4 Examples

Example:

Query the current CBM information.



AT+CSCB=?

+CSCB: (0,1)

OK

## 11.12 AT+CSMS - Command for Setting the Message Service Type

The **AT+CSMS** command sets the message service type.

### 11.12.1 Checking Whether the Command Is Available

Test command	AT+CSMS=?
Function	Checks the parameter range supported by the command.
Response	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CSMS: (list of supported &lt;service&gt;s)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<service>: numeric, which indicates the message service type.

- 0 (default value): 3G TS 23.040, 3G TS 23.041 (The syntax structure of AT commands for short messages is compatible with GSM07.05 Phase 2.)
- 1: 3G TS 23.040, 3G TS 23.041 (The syntax structure of AT commands for short messages is compatible with GSM07.05 Phase 2+.)

## 11.12.2 Reading the Current Message Service Type

<b>Read command</b>	AT+CSMS?
<b>Function</b>	Reads the current message service type.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CSMS: &lt;service&gt;,&lt;mt&gt;,&lt;mo&gt;&lt;bm&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<mt>,<mo>,<bm>: integer values, which indicate whether the MT supports receiving short messages, sending short messages, and broadcasting message services respectively.

- 0: does not support the preceding functions.
- 1 (default value): supports the preceding functions.

## 11.12.3 Setting the Message Service Type

<b>Write command</b>	AT+CSMS=<service>
<b>Function</b>	Sets the message service type.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CSMS: &lt;mt&gt;,&lt;mo&gt;,&lt;bm&gt;&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MS: &lt;CR&gt;&lt;LF&gt;+CMS ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

## 11.12.4 Examples

Example 1:

AT+CSMS=?

+CSMS: (0)

OK

Example 2:

AT+CSMS?

+CSMS: 0,1,1,1

OK

Example 3:

AT+CSMS=0

+CSMS: 1,1,1

OK

## 11.13 +CMTI – Command for Unsolicitedly Reporting SMS Arrival

The **+CMTI** command is used to indicate that a new SM is received.

**URC**                      When the value of **<mt>** in the **AT+CNMI** command is **1**:  
                                 <CR><LF>+CMTI: <mem3><index><CR><LF>

### Parameter description

**<mem3>**: character string, which indicates the memory for storing a new SM that is not directly sent to the TE.

**"SM"**: indicates SIM card.

**<index>**: integer, which indicates the storage position of an SM in the memory.

## 11.14 +CMT – Command for Unsolicitedly Reporting a New SM

The **+CMT** command is used to indicate that a new SM is received.

**URC**                      When the value of **<mt>** in the **AT+CNMI** command is **2** and the PDU mode is adopted:  
                                 <CR><LF>+CMT: <length><CR><LF><pdu>

### Parameter description

**<length>**: integer, which indicates the number of bytes in the TPDU.

<pdu>: PDU. For details, see the **AT+CMGL** command

## 11.15 +CBM – Command for Unsolicitedly Reporting a Cell SM

The **+CBM** command is used to indicate that a new cell SM is received.

**URC**                      When the value of **<bm>** in the **AT+CNMI** command is **2** and the PDU mode is adopted:  
                                 <CR><LF>+CBM: <length><CR><LF><pdu>

### Parameter description

<length>: integer, which indicates the number of bytes in the TPDU.

<pdu>: PDU. For details, see the **AT+CMGL** command.

## 11.16 +CDS – Command for Unsolicitedly Reporting a New SM Status Report

The **+CDS** command is used to indicate that a new SM status report is received.

**URC**                      When the value of **<ds>** in the **AT+CNMI** command is **2** and the PDU mode is adopted:  
                                 <CR><LF>+CMT: <length><CR><LF><pdu>

### Parameter description

<length>: integer, which indicates the number of bytes in the TPDU.

<pdu>: PDU. For details, see the **AT+CMGL** command.



# 12 Commands for the SIM Card

This chapter describes the AT commands related to the SIM card.

## 12.1 AT+CRSM - Command for Accessing a SIM Card Through Restricted SIM Access

The **AT+CRSM** command accesses a SIM card through restricted SIM access.

### 12.1.1 Checking Whether the +CRSM Command Is Available

<b>Test command</b>	AT+CRSM=?
<b>Function</b>	Checks whether the command exists.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of available command: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of unavailable command: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

## 12.1.2 Accessing the SIM Database

<b>Write command</b>	AT+CRSM=<command>[,<fileid>[,<P1>,<P2>,<P3>[,<data>]]]
<b>Function</b>	Accesses the SIM card through restricted permissions.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CRSM: &lt;sw1&gt;,&lt;sw2&gt;[,&lt;response&gt;]&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

This command can access the SIM database through restricted permissions. For example, the IMSI number cannot be changed without permission (authentication is required for change). In addition, the IMSI number cannot be modified through this command.

**Parameter description**

<command>: numeric, which indicates the command for SIM access. The value range is as follows:

- 176: reads the contents on the SIM card in binary mode.
- 178: reads records.
- 192: reads responses.
- 214: updates the contents on the SIM card in binary mode.
- 220: records the updated contents.
- 242: obtains the status.

<fileid>: integer, which indicates the ID of the **EF** file. In addition to the command for status query, all other commands must send this parameter.

<P1>,<P2>,<P3>: In addition to the commands for obtaining the response and querying the status, other commands must specify these parameters. The value ranges from 0 to 255.

<data>: information field in hexadecimal mode.

<sw1>,<sw2>: response returned by the SIM card after the command is executed.

<response>: data reported after the command is successfully executed. For the commands for updating data in binary mode and updating records, the response is not returned.



# 13

## Commands for the Phone Book

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This chapter describes the AT commands that can perform operations on the phone book.

### 13.1 AT+CPBR - Command for Reading the Phone Book

The **AT+CPBR** command reads the phone book.

#### 13.1.1 Checking the Parameter Range Supported by the +CPBR Command

<b>Test command</b>	AT+CPBR=?
<b>Function</b>	Checks the available phone book indexes and the supported length of phone number and name.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CPBR: (list of supported&lt;index&gt;s),[&lt;nlength&gt;],[&lt;tlength&gt;]&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

##### Parameter description

<index>, <index1>, <index2>: integer, which indicates the location in the phone book memory. The values of **index1** and **index2** cannot be larger than the maximum index of the phone book, that is, the **total** field returned by the **AT+CPBS?** command.

<nlength>: integer, which indicates the maximum length of a phone number.

<tlength>: integer, which indicates the maximum length of the name field.

## 13.1.2 +CPBR - Command for Reading the Phone Book

<b>Write command</b>	AT+CPBR=<index1>[,<index2>]
<b>Function</b>	Reads the currently selected phone book records between the index1 and index2 locations in the phone book memory.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: [&lt;CR&gt;&lt;LF&gt;+CPBR: &lt;index1&gt;,&lt;number&gt;,&lt;type&gt; [&lt;CR&gt;&lt;LF&gt;+CPBR: &lt;index2&gt;,&lt;number&gt;,&lt;type&gt;,&lt;text&gt;[...]&lt;CR&gt;&lt;LF&gt;]] &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

- When only one parameter is entered, one phone book record specified by the parameter is returned.
- When two parameters are entered, all phone book records between the two indexes are returned.

**Parameter description**

<number>: string, which indicates the phone number.

<type>: number type. The value **145** indicates an international phone number.

- 145: The telephone number contains the international access code +.
- 129: The telephone number does not contain +.

<text>: string, which indicates the name whose maximum length is <tlength>. The character type is specified by the **AT+CSCS** command.

## 13.1.3 Examples

Example 1:

Check the available phone book indexes and the supported length of phone number and name.

AT+CPBR=?

+CPBR: (1-250),40,16

OK

Example 2:

List all phone book records between index values 10–13.

AT+CPBR=10,13

+CPBR: 10,"13903702895","129"

+CPBR: 11,"13903702873","129"

+CPBR: 12,"13903702856","129"

+CPBR: 13,"13903702803","129"

OK

## 13.2 AT+CPBW - Command for Writing the Phone Book

The **AT+CPBW** command writes a phone book record to the currently selected location that is specified by the index in the phone book memory. If the command parameter contains only the **index** field, the phone book record at the location specified by the **index** field is deleted. If the **index** field is omitted but the parameter contains the **number** field, the phone book record is written to the first empty location.

### 13.2.1 Checking the Parameter Range Supported by This Command

<b>Test command</b>	AT+CPBW=?
<b>Function</b>	Queries the parameter range supported by this command.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CPBW: (list of supported &lt;index&gt;s),[&lt;nlength&gt;],[list of supported &lt;type&gt;s],[&lt;tlength&gt;]&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<index>: integer value, which indicates the location in the phone book memory. The value of **index** cannot be larger than the **total** field returned by the **AT+CPBS?** command.

<nlength>: integer, which indicates the maximum length of a phone number.

<tlength>: integer, which indicates the maximum length of the name field.

## 13.2.2 Writing a Record into the Phone Book

<b>Write command</b>	AT+CPBW=[<index>][,<number>[,<type>[,<text>]]]
<b>Function</b>	Writes a record into the phone book.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

<number> or <text> can be left blank, but cannot be left blank simultaneously.

**Parameter description**

<number>: string, which indicates the phone number.

<type>: integer, which indicates the format of a phone number.

- 145: The phone number contains the international access code "+".
- 129: The phone number does not contain the international access code "+".

<text>: string, which indicates the name whose maximum length is <tlength>. The character type is specified by the **AT+CSCS** command.

## 13.2.3 Examples

Example 1:

Query the parameter range supported by this command.

```
AT+ CPBW=?
```

```
+CPBW: (1-250),40,(129,145),16
```

OK

Example 2:

Write a record into the phone book.

```
AT+CPBW="5","13903702805","test"
```

OK

## 13.3 AT+CPBS - Command for Selecting the Phone Book Memory

The **AT+CPBS** command selects the phone book memory. After the MT restarts, the MT restores the initial setting to "SM". Other commands related to the phone book perform operations by using the phone book memory that is selected by this command.

### 13.3.1 Checking the Value Range Supported by the +CPBS Command

<b>Test command</b>	AT+CPBS=?
<b>Function</b>	Checks the optional items of the phone book memory.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CPBS: (list of supported &lt;storage&gt;s)&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR:&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<storage>: type of the phone book memory. The following table describes the value options of <storage>.

**Table 13-1** Value options of <storage>

Value	Description
SM	Phone book on the SIM card (default value)
LD (not supported currently)	Dialed phone number on the MT
EN (not supported currently)	Emergency call number on the SIM card (or MT)
FD (not supported currently)	Fixed dial number on the SIM card. The PIN2 code must be verified when the option is used.
ON (not supported currently)	Local phone number on the SIM card
RC (not supported currently)	List of recent caller IDs on the MT
MC (not supported current)	List of missing calls of the MT.

### 13.3.2 Reading the Current Memory of the Phone Book

<b>Read command</b>	AT+CPBS?
<b>Function</b>	Reads the current memory of the phone book.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CPBS: &lt;storage&gt;[,&lt;used&gt;,&lt;total&gt;]&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<used>: integer value, which indicates the number of used entries in the currently selected memory.

<total>: integer value, which indicates the maximum number of entries in the currently selected memory.

### 13.3.3 Setting the Memory Type of the Phone Book

<b>Write command</b>	AT+CPBS=<storage>
<b>Function</b>	Sets the memory type of the phone book.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### 13.3.4 Examples

Example 1:

AT+CPBS=?

+CPBS: ("FD","SM","ON","LD","MC","RC","EN")

OK

Example 2:



AT+CPBS?

+CPBS: "SM",23,250

OK

Example 3:

AT+CPBS="SM"

OK

# 14

## Commands for Hardware Control

This chapter describes the AT commands that operate the hardware.

### 14.1 AT+CALA

The **AT+CALA** command sets the alarm time on the ME. When the set alarm time is reached, the alarm sends a URC, and the alarm time is reset to "00/01/01,00:00:00".

The alarm provides two functions:

- Timed notification SM: When the module is not powered off, a timed SM can be unsolicitedly reported through +CALA.
- Clock mode: When the module is powered off, the clock function can be used to wake up the module. When the module is powered off, and the set alarm time is reached, the module is waken up, and the +CALA is unsolicitedly reported.

#### 14.1.1 Checking the Parameter Range Supported by This Command

<b>Test command</b>	AT+CALA=?
<b>Function</b>	Checks the parameter range supported by this command.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+ CALA: (list of supported&lt;n&gt;s), (list of supported&lt;type&gt;s), (list of supported&lt;length&gt;s) &lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR:&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<n>: integer, which indicates the index of the alarm clock array.



<type>: integer, which indicates the type of the set alarm clock. The value of this parameter is as follows:

0: alarm clock reporting (text message)

<tlength>: integer, which indicates the maximum length of text. Value range: 0–16.  
Default value: **16**.

## 14.1.2 Querying the Set Alarm Clock

<b>Read command</b>	AT+CALA?
<b>Function</b>	Queries the set alarm clock.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+ CALA: &lt;time&gt;[, &lt;n&gt;[, &lt;type&gt;[, &lt;text&gt;]]]&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

The ME can set only one alarm clock at one time. When the second alarm clock is set, the setting of the first alarm clock is deleted. Therefore, during query, the value of <n> is always **0**.

### Parameter description

<time>: string, which indicates the alarm time to be set. The format is "yy/MM/dd,hh:mm:ss".

<text>: string, which indicates the text to be displayed when the alarm clock timer expires. The default value is a null string.

## 14.1.3 Setting an Alarm Clock

<b>Write command</b>	AT+ CALA=<time>[, <n>[, <type>[, <text>]]]
<b>Function</b>	Sets an alarm clock.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>



## 14.1.4 +CALA – Command for Reporting Unsolicitedly

**URC1** Reports a notification SM <CR><LF>+CALA: [<text>]<CR><LF>

**URC2** Indicates that the ME is waken up and enters into the alarm clock mode. If the module is in adaptive baud rate mode, <text> but not +CALA is displayed.

<CR><LF>^SYSSTART ALARM MODE<CR><LF>

<CR><LF>+CALA: <text><CR><LF>

## 14.1.5 Examples

Example 1:

Check the parameter range supported by the **+CALA** command.

AT+CALA=?

+CALA: (0),(0),(1-16)

OK

Example 2:

Query the current alarm clock.

AT+CALA?

+CALA: "10/03/03,15:20:00",0,0,"Alarm"

OK

Example 3:

Set an alarm clock.

AT+CALA="10/03/03,15:20:00"

OK

## 14.2 AT+CCLK – Command for Setting the System Time

The **AT+CCLK** command sets the system runtime of the ME. As long as the ME is powered on, the time works.

## 14.2.1 Checking Whether the Command for Setting the System Time Exists

<b>Test command</b>	AT^CCLK=?
<b>Function</b>	Checks whether this command exists.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR:&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR:&lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

## 14.2.2 Querying the Current System Time

<b>Read command</b>	AT+CCLK?
<b>Function</b>	Queries the current system time.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CCLK: &lt;time&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR:&lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<time>: string, which indicates the current system time of the ME. The format is "yy/MM/dd,hh:mm:ss".

## 14.2.3 Setting the System Time

<b>Write command</b>	AT+CCLK=<time>
<b>Function</b>	Sets the system time.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR:&lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>



## 14.2.4 Examples

Example 1:

Query the current system time.

AT+CCLK?

+CCLK: "10/02/15,12:10:04"

OK

Example 2:

Set the system time.

AT+CCLK="10/02/15,12:10:50"

OK

# 15

## Commands for Audio Control

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This chapter describes the AT commands for audio control.

### 15.1 AT^SWSPATH - Command for Switching Between Audio Channels

The **AT^SWSPATH** command switches the audio channel.

#### 15.1.1 Querying the Supported Audio Channel

<b>Test command</b>	AT^SWSPATH=?
<b>Function</b>	Queries the supported audio channel.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;^SWSPATH: (list of supported &lt;n&gt;s)&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li></ul>

##### Parameter description

<n>: integer, which indicates the audio channel.

- 0 (default value): indicates that the first audio channel is supported.
- 1: indicates that the second audio channel is supported..

## 15.1.2 Reading the Current Audio Channel

<b>Read command</b>	AT^SWSPATH?
<b>Function</b>	Reads the current audio channel.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;^SWSPATH: &lt;n&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li></ul>

## 15.1.3 Switching the Audio Channel

<b>Write command</b>	AT^SWSPATH=<n>
<b>Function</b>	Switches the audio channel.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt; +CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

The audio channel is kept in the channel that is used in the last call after the call ends. If the module is restarted, the audio channel will be reset to the first channel.

## 15.2 AT+CMIC - Command for Adjusting the Microphone Gain Level

The **AT+CMIC** command adjusts the the microphone gain level.

### 15.2.1 Querying the Supported Microphnoe Gain Levels

<b>Test command</b>	AT+CMIC=?
<b>Function</b>	Queries the supported microphnoe gain levels.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CMIC: (list of supported &lt;level&gt;s) &lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li></ul>

**Parameter description**

<level>: integer; indicates the microphone gain level; value range: –12 to +13;  
Default value: 0.

- –12: minimum gain
- 12: maximum gain
- 13: microphone muted

## 15.2.2 Querying the Current Microphone Gain Level

<b>Read command</b>	AT+CMIC?
<b>Function</b>	Queries the current microphone gain level
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CMIC: &lt;level&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li></ul>

## 15.2.3 Setting the Microphone Gain Level

<b>Write command</b>	AT+CMIC=<level>
<b>Function</b>	Sets the microphone gain level
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt; +CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

This command applies to both audio channels, but it can be executed only before a voice call is initiated.

## 15.3 AT^ECHO - Command for Suppressing the Echo

The **AT^ECHO** command suppresses the echo.



## 15.3.1 Querying the Supported Echo Suppressing Functions

<b>Test command</b>	AT^ECHO=?
<b>Function</b>	Queries the supported echo suppressing functions.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;^ECHO: (list of supported &lt;n&gt;s) &lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error:&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<n>: integer

- 0: disables the echo suppressing function.
- 1 (default value): enables the echo suppressing function.

## 15.3.2 Reading the Current Settings of the Echo Suppressing Function

<b>Read command</b>	AT^ECHO?
<b>Function</b>	Reads the current settings of the echo suppressing function.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;^ECHO: &lt;n&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error:&lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li></ul>



### 15.3.3 Setting the Echo Suppressing Function

<b>Write command</b>	AT^ECHO=<n>
<b>Function</b>	Sets the echo suppressing function.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt; +CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

This command applies to both audio channels, but it can be executed only before a call is initiated.

## 15.4 AT+CLVL - Command for Adjusting the Speaker Volume

The **AT+CLVL** command adjusts the speaker volume.

### 15.4.1 Querying the Supported Speaker Volume Level

<b>Test command</b>	AT+CLVL=?
<b>Function</b>	Queries the supported speaker volume levels.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CLVL: (list of supported &lt;n&gt;s) &lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li></ul>

**Parameter description**

<n>: integer; value range: 0 to 5.

- 1: minimum volume
- 5: maximum volume
- 0: speaker muted
- 4: default value



## 15.4.2 Reading the Current Speaker Volume

<b>Read command</b>	AT+CLVL?
<b>Function</b>	Reads the current speaker volume.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CLVL: &lt;n&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li></ul>

## 15.4.3 Setting the Speaker Volume

<b>Write command</b>	AT+CLVL=<n>
<b>Function</b>	Sets the speaker volume.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: related to the MT: &lt;CR&gt;&lt;LF&gt; +CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

- This command applies to both audio channels. You can set the volume level to **1, 2, 3, 4**, or **5** before or during a call and the setting remains effective even after the module is powered off. You can set the volume level to **0** to mute the speaker only during a call. After the call ends, the speaker volume is restored to the volume level before the speaker is muted.

## 15.5 AT+CMUT - Command for Muting and Unmuting the Microphone

The **AT+CMUT** command is used to mute and unmute the microphone.



## 15.5.1 Querying the Supported Muting Settings for the Microphone

<b>Test command</b>	AT+CMUT=?
<b>Function</b>	Queries the supported muting settings for the microphone.
<b>Response</b>	<CR><LF>+CMUT: (list of supported <n>s)<CR><LF> <CR><LF>OK<CR><LF>

### Parameter description

<n>: integer

- 0 (default value): unmutes the microphone.
- 1: mutes the microphone.

## 15.5.2 Reading the Current Muting Settings of the Microphone

<b>Read command</b>	AT+CMUT?
<b>Function</b>	Reads the current muting settings of the microphone.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;+CMUT: &lt;n&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt; +CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Note:

This command can be used only during a call.



## 15.5.3 Setting the Muting Function of the Microphone

**Write command**      AT+CMUT=<n>

**Function**            Sets the muting function of the microphone.

**Response**            • In case of successful execution:  
                         <CR><LF>OK<CR><LF>  
                         • In case of an error: <CR><LF>ERROR<CR><LF>  
                         • In case of an error related to the MT:<CR><LF> +CME ERROR:  
                         <err><CR><LF>

**Note:**

- This command applies to both audio channels. The microphone will be restored to its default setting after a call.
- This command can be used only during a call.



# 16 Other Commands

This chapter describes auxiliary commands that are not covered by the preceding chapters.

## 16.1 A/ - Command for Executing the Previous Command Again

The **A/** command executes the previous command again.

### 16.1.1 Execution Command

<b>Execution command</b>	A/
<b>Function</b>	Executes the previous command.
<b>Response</b>	Same as the output result of the previous command.

### 16.1.2 Examples

Example:

Execute the previous command.

AT+CREG?

+CREG: 0,1

OK

A/

+CREG: 0,1

OK



## 16.2 ATS3 – Command for Setting the Command Line Ending Character

This command sets the command line ending character S3, which saves the command line ending character as an ASCII code. This character is sent by the TE, indicating the end of a command line.

### 16.2.1 Querying the Current Command Line Ending Character

<b>Read command</b>	ATS3?
<b>Function</b>	Queries the current command line ending character.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;&lt;n&gt;&lt;CR&gt;&lt;LF&gt; &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR:&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<n>: integer, which indicates the ASCII code of the command line ending character.  
Value range: 1~7, 10~64, 66~83, 85~96, 98~115, 117~127. Default value: **13**.

### 16.2.2 Setting the Command Line Ending Character

<b>Write command</b>	ATS3=<n>
<b>Function</b>	Sets the command line ending character.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Note:

<n> is not allowed starting with “0x”, or regarding as ATS3=0.

### 16.2.3 Examples

Example 1:

Query the current command line ending character.

ATS3?

013

OK

Example 2:

Set the command line ending character.

ATS3=13

OK

## 16.3 ATS4 – Command for Setting the Response Format Character

This command sets the response format character. This character is sent by the TE and is involved in the head, tail, and end tags of the result code and information response. If the S4 character in a command line is changed, the result code in this command line uses the new S4 character immediately.

### 16.3.1 Querying the Current Format Character

<b>Read command</b>	ATS4?
<b>Function</b>	Queries the current response format character.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;&lt;n&gt;&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR:&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

#### Parameter description

<n>: integer, which indicates the ASCII code of the response format character. Value range: 0–127. Default value: **10**.

## 16.3.2 Setting the Response Format Character

<b>Write command</b>	ATS4=<n>
<b>Function</b>	Sets the response format character.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

**Note:**

<n> is not allowed starting with "0x", or regarding as ATS4=0.

## 16.3.3 Examples

Example 1:

Query the current response format character.

ATS4?

010

OK

Example 2:

Set the response format character.

ATS4=10

OK

## 16.4 ATS5 - Command for Setting the Backspace Character

This command sets the backspace character S5. This character is sent by the TE, indicating the operation of deleting the previous character. This character is identified and acknowledged by the MS.



## 16.4.1 Querying the Current Backspace Character

<b>Read command</b>	ATS5?
<b>Function</b>	Queries the current backspace character.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;&lt;n&gt;&lt;CR&gt;&lt;LF&gt;&lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR:&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Parameter description

<n>: integer, which indicates the ASCII code of the backspace character. Value range: 0–127. Default value: 8. It is saved upon power failure.

## 16.4.2 Setting the Current Backspace Character

<b>Write command</b>	ATS5=<n>
<b>Function</b>	Sets the backspace character.
<b>Response</b>	<ul style="list-style-type: none"><li>• In case of successful execution: &lt;CR&gt;&lt;LF&gt;OK&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error during command execution: &lt;CR&gt;&lt;LF&gt;ERROR:&lt;CR&gt;&lt;LF&gt;</li><li>• In case of an error related to the MT: &lt;CR&gt;&lt;LF&gt;+CME ERROR: &lt;err&gt;&lt;CR&gt;&lt;LF&gt;</li></ul>

### Note:

<n> is not allowed starting with “0x”, or regarding as ATS5=0

## 16.4.3 Examples

Example 1:

Query the current backspace character.

ATS5?

008

OK

Example 2:

Set the backspace character.

ATS5=8

OK

## 16.5 ^THERM - Command for Unsolicitedly Reporting Temperature Protection

The **^THERM** command is used to unsolicitedly report the temperature protection. The URC cannot be disabled currently.

URC            <CR><LF>^THERM: <mode><CR><LF>

**Note:**

The temperature protection report is submitted automatically when the RF is enabled or disabled by the temperature protection function.

### Parameter description

<mode>: indicates the action performed by the current temperature protection function.

- 0: indicates that the temperature exceeds the temperature limit and that the module deregisters with the network and disables the RF.
- 1: indicates that the temperature falls back to the safe temperature range and the module enables the RF.

# 17

## Appendix

List of effects on AT commands imposed by SIM PIN

- Ø The command is unavailable.
- The PIN1 code does not need to be verified for the command.
- + The PIN1 code needs to be verified for the command.
- ± The PIN1 code needs to be verified for the command in certain cases.

**Table 17-1** List of effects on AT commands imposed by SIM PIN

AT Command	Execution Command	Test Command	Read Command	Write Command
Commands for configuration				
AT&F	-	Ø	Ø	Ø
AT&V	-	Ø	Ø	Ø
AT&W	-	Ø	Ø	Ø
ATQ	-	Ø	Ø	Ø
ATV	-	Ø	Ø	Ø
ATZ	-	Ø	Ø	Ø
ATE	-	Ø	Ø	Ø
AT+CFUN	Ø	-	-	-
AT^SMSO	-	-	Ø	Ø
AT+GCAP	-	-	Ø	Ø
AT+CMEE	Ø	-	-	-



AT+CSCS	Ø	-	-	-
AT^SCFG	Ø	-	-	-
<b>Commands for status control</b>				
AT+CMER	Ø	+	+	+
AT+CIND	Ø	-	-	-
AT^SIND	Ø	-	-	-
AT+WS46	Ø	-	-	-
<b>Commands for serial port control</b>				
ATIQ	-	Ø	Ø	Ø
AT&C	-	Ø	Ø	Ø
AT&D	-	Ø	Ø	Ø
AT&S	-	Ø	Ø	Ø
AT+IPR	Ø	-	-	-
AT+CMUX	Ø	-	-	-
<b>Commands for security control</b>				
AT+CPIN	Ø	-	-	-
AT+CLCK	Ø	+	Ø	+
AT+CPWD	Ø	+	Ø	+
<b>Commands for identification</b>				
ATI	-	Ø	Ø	Ø
AT+CGMI/AT+GMI	-	-	Ø	Ø
AT+CGMM/AT+GMM	-	-	Ø	Ø
AT+CGMR/AT+GMR	-	-	Ø	Ø
AT+CGSN/AT+GSN	-	-	Ø	Ø
AT+CIMI	+	+	Ø	Ø
<b>Commands for call control</b>				
ATD	+	Ø	Ø	Ø
ATD*99#	+	Ø	Ø	Ø
ATD*98#	+	Ø	Ø	Ø
ATH	-	Ø	Ø	Ø
ATA	+	Ø	Ø	Ø
ATS0	Ø	Ø	-	-



ATS7	Ø	Ø	-	-
AT+CRLP	Ø	-	-	-
AT+CBST	Ø	-	-	-
+++	-	Ø	Ø	Ø
ATO	-	Ø	Ø	Ø
AT+CHUP	+	+	Ø	Ø
AT+CR	Ø	+	+	+
AT+CRC	Ø	-	-	-
AT+VTS	Ø	Ø	Ø	-
AT+CLIP	Ø	+	+	+
<b>Commands for network services</b>				
AT+COPN	+	+	Ø	Ø
AT+COPS	Ø	-	±	±
AT+CREG	Ø	-	-	-
AT+CSQ	-	-	Ø	Ø
AT^SMONC	+	+	Ø	Ø
AT^SMOND	+	+	Ø	Ø
AT^MONI	-	-	Ø	-
AT^MONP	-	-	Ø	-
AT^SMONG	+	+	Ø	+
AT^SPLM	+	+	Ø	Ø
AT+CPOL	Ø	+	+	+
AT^SPLR	Ø	+	Ø	+
AT^SPLW	Ø	+	Ø	+
AT+CNUM				
<b>Commands for data services</b>				
AT+CGACT	Ø	+	+	+
AT+CGATT	Ø	+	+	+
AT+CGREP	Ø	+	+	+
AT+CGDATA	Ø	+	Ø	+
AT+CGDCONT	Ø	+	+	+
AT+CGPADDR	Ø	+	Ø	+



AT+CGQMIN	Ø	+	+	+
AT+CGQREQ	Ø	+	+	+
AT+CGREG	Ø	+	+	+
AT+CGSMS	Ø	+	+	+
AT^SGCONF	Ø	-	-	-
<b>Commands for Internet services</b>				
AT^SICS	Ø	-	-	-
AT^SICI	Ø	-	-	-
AT^SISS	Ø	-	-	-
AT^SISI	Ø	-	-	-
AT^SISO	Ø	-	-	+
AT^SISC	Ø	-	Ø	+
AT^SISR	Ø	-	Ø	+
AT^SISW	Ø	-	Ø	+
<b>Commands for short messages</b>				
AT+CMGD	Ø	+	Ø	+
AT+CMGF	Ø	-	-	-
AT+CMGL	+	+	Ø	+
AT+CMGR	Ø	+	Ø	+
AT+CMGS	Ø	+	Ø	+
AT+CMGW	+	+	Ø	+
AT+CMSS	Ø	+	Ø	+
AT+CNMI	Ø	+	+	+
AT+CPMS	Ø	+	+	+
AT+CSCA	Ø	+	+	+
AT+CSCB	Ø	+	+	+
AT+CSMP	Ø	+	+	+
AT+CSMS	Ø	+	+	+
<b>Command related to the SIM card</b>				
AT+CRSM	Ø	+	Ø	+
<b>Commands for the phone book</b>				
AT+CPBR	Ø	+	Ø	+



AT+CPBS	Ø	+	+	+
AT+CPBW	Ø	+	Ø	+
<b>Commands related to the hardware</b>				
AT+CALA	Ø	-	-	-
AT+CCLK	Ø	-	-	-
<b>Commands for audio control</b>				
AT^SWSPATH	-	-	-	-
AT+CMIC	-	-	-	-
AT^ECHO	-	-	-	-
AT+CLVL	-	-	-	-
AT+CMUT	-	-	-	-
<b>Other commands</b>				
ATA/	-	Ø	Ø	Ø
ATS3	Ø	Ø	-	-
ATS4	Ø	Ø	-	-
ATS5	Ø	Ø	-	-

## 17.1 List of URC Commands

Table 17-2 List of URC commands

AT Command	URC
<b>Commands for configuration</b>	
AT+CFUN	^SYSSTART
AT+CFUN	^SYSSTART CHARGE ONLY MODE
AT^SMSO	^SHUTDOWN
<b>Commands for status control</b>	
AT+CMER	+CIEV: <indDescr>, <indValue>1[, <indValue>2]
AT^SIND	+CIEV: <indDescr>, <indValue>
AT^SIND	+CIEV: <indDescr>, <nitzUT>, <nitzTZ>, <nitzDST>
<b>Commands for call control</b>	
AT+CRC	RING

AT+CRC	+CRING: <type>
<b>Commands for network services</b>	
AT+CREG	+CREG: <stat>
AT+CREG	+CREG: <stat>[, <lac>, <ci>]
<b>Commands for Internet services</b>	
AT^SISO	^SISW: <srvProfileId>, <urcCauseId>
AT^SISR	^SISR: <srvProfileId>, <urcCauseId>
AT^SISW	^SISW: <srvProfileId>, <urcCauseId>
^SIS	^SIS: <srvProfileId>, <urcCause>[, [<urcInfoId>][, <urcInfoText>]]
<b>Commands for data services</b>	
AT+CGEREP	+CGEV: REJECT <PDP_type>, <PDP_addr>
AT+CGEREP	+CGEV: NW REACT <PDP_type>, <PDP_addr>, [<cid>]
AT+CGEREP	+CGEV: NW DEACT <PDP_type>, <PDP_addr>, [<cid>]
AT+CGEREP	+CGEV: ME DEACT <PDP_type>, <PDP_addr>, [<cid>]
AT+CGEREP	+CGEV: NW DETACH
AT+CGEREP	+CGEV: ME DETACH
AT+CGEREP	+CGEV: NW CLASS <class>
AT+CGEREP	+CGEV: ME CLASS <class>
AT+CGREG	+CGREG: <stat>
<b>Commands for short messages</b>	
AT+CNMI	+CMTI: <mem3>, <index>
AT+CNMI	+CMT: <length><CR><LF><pdu>
AT+CNMI	+CBM: <length><CR><LF><pdu>
AT+CNMI	+CDS: <length><CR><LF><pdu>
<b>Commands related to the hardware</b>	
AT+CALA	+CALA: [<text>]
AT+CALA	^SYSSTART ALARM MODE +CALA: <text>



## 17.2 List of CME/CMS ERROR Codes

**Table 17-3** Common “CME ERROR” codes

<err> Code	Text (AT+CMEE=2)
0	phone failure
1	no connection to phone
2	phone-adapter link reserved
3	Operation not allowed
4	Operation not supported
5	PH-SIM PIN required
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	Incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
20	Memory full
21	invalid index
22	not found
23	Memory failure
24	text string too long
25	invalid characters in text string
26	dial string too long
27	invalid characters in dial string
30	no network service
31	Network timeout
32	Network not allowed emergency calls only

<err> Code	Text (AT+CMEE=2)
40	Network personalization PIN required
41	Network personalization PUK required
42	Network subset personalization PIN required
43	Network subset personalization PUK required
44	service provider personalization PIN required
45	service provider personalization PUK required
46	Corporate personalization PIN required
47	Corporate personalization PUK required
99	No text information is available currently.
100	Unknown
101	PUK1 blocked
102	PUK2 blocked
132	service option not supported
133	requested service option not subscribed
134	service option temporarily out of order

**Table 17-4** “CME ERROR” codes related to the GPRS

<err> Code	Text (AT+CMEE=2)
103	Illegal MS
106	Illegal ME
107	GPRS services not allowed
111	PLMN not allowed
112	Location area not allowed
113	Roaming not allowed in this location area
148	unspecified GPRS error
149	PDP authentication failure
150	invalid mobile class

**Table 17-5** “CMS ERROR” codes related to the SMS

<err> Code	Text (AT+CMEE=2) (Not Supported Currently)
0...127	3GPP TS 24.011[6] clause E.2 values
128...255	3GPP TS 23.040[3] clause 9.2.3.22 values
300	ME failure
301	SMS service of ME reserved
302	Operation not allowed
303	Operation not supported
304	Invalid PDU mode parameter
305	Invalid text mode parameter
310	SIM not inserted
311	SIM PIN required
312	PH-SIM PIN required
313	SIM failure
314	SIM busy
315	SIM wrong
316	SIM PUK required
317	SIM PIN2 required
318	SIM PUK2 required
320	Memory failure
321	Invalid memory index
322	Memory full
330	SMSC address unknown
331	no network service
332	Network timeout
340	NO +CNMA ACK EXPECTED
500	Unknown error

**Table 17-6** “CME ERROR” codes related to the MG323 only

<err> Code	Text (AT+CMEE=2)
615	network failure



616	network is down
639	service type not yet available
640	operation of service temporary not allowed
764	missing input value
765	invalid input value
767	operation failed

## 17.3 Acronyms and Abbreviations

**Table 17-7** Acronyms and abbreviations

Acronym and Abbreviation	Full Spelling
3GPP	Third Generation Partnership Project
APN	Access Point Name
ARFCN	Absolute Frequency Channel Number
BCC	Base station Color Code
BCCH	Broadcast Control Channel
BER	Bit Error Rate
CDMA	Code Division Multiple Access
CS	Circuit Switched (CS) domain
CUG	Closed User Group
DCE	Data Circuit Equipment
DCS	Data Coding Scheme
DTE	Data Terminal Equipment
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IP	internet Protocol
ITU-T	International Telecommunication Union-Telecommunication Standardization Sector
MCC	Mobile Country Code
ME	Mobile Equipment
MNC	Mobile Network Code
MS	Mobile Station
MSIN	Mobile Station Identification Number
MSISDN	Mobile Station International ISDN Number
MT	Mobile Terminal
NCC	Network Color Code



Acronym and Abbreviation	Full Spelling
NOM	Network Operation Mode
PAT	Priority Access Threshold
PBCCH	Packet Broadcast Control Channel
PD	Position Determination
PDP	Packet Data Protocol
PDU	Protocol Data Unit
PIN	Personal Identity Number
PLMN	Public Land Mobile Network
PPP	Point-to-Point Protocol
PUK	PIN Unblocking Key
PS	Packet Switched (PS) domain
QoS	Quality of Service
RAC	Routing Area Code
RPLMN	Registered PLMN
RSSI	Receive Signal Strength Indicator
SCA	Service Center Address
SDU	Service Data Unit
SIM	GSM Subscriber Identity Module
SM	Short Message
SMS	Short Message Service
SMSC	Short Message Service Center
SNDCP	Subnetwork Dependent Convergence Protocol
TA	Timing Advance Value
TA	Terminal Adapter
TE	Terminal Equipment
TPDU	Transfer Protocol Data Unit
TCH	Traffic Channel
UIM	User Identity Module
URC	Unsolicited Result Code
USIM	Universal Subscriber Identity Module
USSD	Unstructured Supplementary Service Data



Acronym and Abbreviation	Full Spelling
VP	Validity Period
XCD	Carrier Detection Signal
XER	DTE Ready Signal
WCDMA	Wideband CDMA